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THE HIGH SCHOOL DEPARTMENT OF THE STATE ASSOCIATION.

PROCEEDINGS OF RECENT SEMI-ANNUAL SESSION AT STATE COLLEGE.

THE two meetings of this department which were held in the Agricultural Building on Wednesday, July 8th at 4 p. m., and Thursday at 11 a. m., the President, Dr. Cheesman A. Herrick, of the Philadelphia High School, in the chair, were both well attended and of unusual interest.

EQUIPMENT OF A SMALL HIGH SCHOOL FOR TEACHING AGRICULTURE

was the subject of a talk by John W. Gilmore, Professor of Agronomy, Pennsylvania State College. He had prepared a complete exhibit of the books, apparatus, collections, etc., which were to be referred to in his remarks, and this was examined with interest by many teachers before and after the session.

As Prof. Gilmore's address consisted of references to the articles in his exhibit as they were enumerated, we give the lists below as he gave them:

For free information concerning Agriculture the following were named:

I. From the U. S. Department of Agriculture, Division "Publications"; the monthly list of publications of the Department of Agriculture; list of publications for sale, and list of publications for free distribution.

II. From U. S. Department of Agriculture, Office, "Experiment Stations"; the list of Experiment Stations publications; circulars on agricultural education; Experiment Station records ($1.00); Farmers Bulletins; and Year Books, 1896–1906.

III. From U. S. Department of Interior, Census building; Census Report, vols. 5 and 6.

IV. From Secretary of Agriculture, Harrisburg, Pa.; the Pennsylvania Bulletins and Reports; Bulletins and reports of State College Experiment Station.

The above list includes the best sources of agricultural information useful to high schools, which should be found in all school libraries. Forage and Fiber Crops in America, Hunt, $1.17; Cereals in America, Hunt, $1.17; Fertilizers, Vorhees, 80 cents; Forage Crops, Vorhees, 95 cents; Experiments with Plants, Osterhout, $1.00; Principles of Fruit Growing, Bailey, $1.00; Fertility of the Land, Roberts, $1.00; Farmstead, Roberts, $1.00; Horticulturist Rule Book, Bailey, 48 cents; Corn Plants, Sargent, 48 cents; Practical Garden Book, Bailey, 40 cents; The Soil, King, $1.00; Irrigation and Drainage, King, $1.20; Soils and How to Treat Them, Brooks, $1.25; Manures, Fertilizers and Farm Crops, Brooks, $1.25; Principles of Agriculture, Bailey, 80 cents; Agriculture for Beginners, Burkett, Stevens and Hill, 68 cents; First Principles of Agriculture, Goff and Mayne, 72 cents; Elementary Agriculture, Bessey and others, 55 cents; Judging and Grading Grains, Lyons and Montgomery, 40 cents; Agriculture through the Laboratory and School Garden, Jackson and Daugherty, $1.35; First Book of Farming, 90 cents; and First Principles of Soil Fertility, Vivian, 90 cents; The total cost of these books is $22.20.

Other free references: One set of Farmers Bulletins suitable to the locality,

copy of list of publications for free distribution, copy of list of publications for sale, copy of monthly list of publications, copy of experiment station record, copy each of the separates of areas where soil surveys have been made in Pennsylvania, separates from the year books, Nos. 83, 124, 159, 279, 310; copy of office of experiment stations bulletin No. 186; copies of the year book for 1896–1906; Pennsylvania state bulletins and reports, State Board of Agriculture publications; also one copy Rural New Yorker, Country Gentleman, National Stockman and Farmer, American Agriculturist, Farming, and Breeders Gazette.

One copy each of the following books was recommended for the school library: Physics of Agriculture, King, $1.75; Chemistry of Plant and Animal Life, Snyder, $1.00. For equipment under a competent teacher the school should have one compound microscope, magnifying about 500 diameters, B. H. stand with double nose piece, two-thirds and one-sixth objectives and one-inch ocular, price $30.00; 6 tripod magnifiers, $1.62; 1 balance, weighing to centigram, $15.00; 1 spring balance, 20 cents; 12 pint fruit jars, $1.00; 12 quart fruit jars, $1.15; 50 test-tubes, $1.25; 1 test-tube rack, 27 cents; 6 beakers, 200 c.c., 70 cents; 12 flower pots with saucers, 4 inch, 60 cents; 12 flower pots with saucers, 6 inch, 75 cents; 1 gasoline burner or oil lamp stove, $4.00; 6 evaporating dishes, 75 cents; 1 school set of economic seeds and weed seeds, $3.00; 1 school set of soil samples, $1.50; 1 note book, 50 cents; tailors tape, 5 cents; spading fork, 65 cents; pail, 50 cents; rule, 5 cents; spade, 50 cents soil auger, $1.25; 12 wide mouth bottles and corks, 75 cents; 2 lbs. unslaked lime, 10 cents; graduate, 500 c.c., $1.00; 2 thermometers, 212° F., 100° C., $1.90; 1 lb. chalk dust, 15 cents; 1 lb. lampblack, 15 cents; 2 small boxes, 20 cents; 2 glass plates, 20 cents; 3 glass tubes, 1½ in. diameter, 3 ft. long, $1.25; 25 one-inch rubber bands, 40 cents; 6 white blotters, 5 cents; 6 dishes, 75 cents; 1 pair small scissors, 25 cents; 1 pair forceps, 25 cents; 50 8-oz. bags, 10 cents; 1 pruning saw, 75 cents; 1 pruning knife, 40 cents; 1 pair pruning shears, 35 cents; 1 lb. copper sulphate, 10 cents; 1 lb. ferrocyanide of potash, 10 cents; ½ oz. cover glasses, No. 2, square, 35 cents; and ½ gross slides, No. 1290, 40 cents. The entire cost of this equipment is $76.24.

Of material needed there should be a small quantity of builder's sand, 10 cents; a small quantity of clay, 10 cents; a small quantity of sandy loam, 10 cents; small quantity of leaf mold, 10 cents; quantity of good rich soil, 10 cents; samples of common diseases and insects for class study, $1.00; and 2 quarts distilled water, 10 cents. Also pint samples of nitrate of soda, 10 cents; muriate of potash, 10 cents; acid phosphate, 10 cents; dried blood, 10 cents; sulphate of ammonia, 10 cents; sulphate of potash, 10 cents; ground bone, 10 cents; and dissolved bone, 10 cents. Heads of red clover, 5 cents; white clover, 5 cents; alsike, 5 cents; alfalfa, 5 cents; black medio, 5 cents; and vetch, 5. Also 25 ears of Dent corn, 50 cents; flint corn, 12 cents; sweet corn, 12 cents; pop corn, 12 cents; and flour corn, 25 cents. Seeds of Soy beans, 10 cents; cow peas 10 cents; white oats, 10 cents; black oats, 10 cents; durum wheat, 10 cents; white wheat, 10 cents; northern spring wheat, 10 cents; red winter wheat, 10 cents; white barley, 10 cents; and bunch samples of red clover, 5 cents; white clover, 5 cents; alsike clover, 5 cents; alfalfa, 5 cents; side oats, 5 cents; panicle oats, 5 cents; bald wheat, white glumes, 5 cents; bearded wheat, white glumes, 5 cents; bald wheat, bronze glumes, 5 cents; bearded wheat, bronze glumes, 5 cents; with samples of potatoes, white pink, scabby, 25 cents. The cost of this material is $5.46. The total cost of books, equipment and material is $103.90.

Prof. Gilmore said that the cost of equipment might be reduced by using a cheaper ($10.00) dissecting microscope instead of the one mentioned in the list. Grains, grasses, etc., growing in the neighborhood can also be collected instead of bought. He also called attention to two collections which can be obtained for the cost of the cases, one dollar each. The first is a collection of Economic Seeds from the United States Department of Agriculture, Seed Laboratory. A collection of "Weed" seeds may also be had from the same place. The second is a set of soil samples from the U. S. Department of Agriculture, Bureau of Soils.

He said in closing, that at present it would be difficult to get qualified teachers of agriculture. An experiment will be made at Ebensburg and at Mount Gretna this summer, to discover whether teachers can be shown, in six weeks how to teach a given syllabus. If so, it would be a desirable thing for the State College to open a summer school for this purpose next year.

The next paper in the order of the pro-

gramme was by Mr. W. S. Hertzog, State Inspector of High Schools, upon the

EQUIPMENT FOR TEACHING PHYSICS, FOR THE SMALL HIGH SCHOOL.

One of the immediate results of High School Inspection has been to reveal the actual conditions that exist in the high schools of the State. It has not been difficult for any given district to make out a course of study that would receive the approval of the Department of Public Instruction. But to have an approved course of study is one thing,—to have conditions favorable for a strong and efficient administration of such a course is quite another.

Before the topic assigned to me can be properly discussed, it is necessary to get a glimpse of the small high school, as it had developed, before the work of inspection began. Many of our schools both in boroughs and townships have but one teacher whose work must be done in one room. A majority of such teachers have three distinct grades to teach, and since the lowest usually is purely a grammar grade, the program calls for 18 to 24 daily recitations.

It is almost universal that our students pursue too many studies and our teachers conduct too many recitations, to do any work as intensively as it should be done. Such a congested program results in two modes of procedure. Either the teacher has fifteen minute recitations, sometimes conducting two or three at the same time, or he follows what has been dubbed the "Rotary Program." In this plan he teaches as much of his program to-day as he can get through and then begins tomorrow where he left off to-day. Both plans are fatal to good high school work. The disease is deep-seated. The necessity for such plans should be removed. How can such a program give results in such work as Algebra, Geometry, Latin, or Physics?

Two influences have produced this very undesirable condition. In order to claim the special high school appropriation, the subjects suggested by the State Superintendent in the State Course have been adopted and the common branches have been retained, because in many communities the high school is judged by the ability of its graduates to pass the county superintendent's examination for a provisional certificate. Our high school students are in the position of the young lady who had traveled extensively. On a certain occasion she was asked, "Have you ever been through Algebra?" "Oh yes, but it was after dark, and I didn't see much of the place."

Can Physics be taught acceptably under such circumstances? It seems reasonable, inasmuch as Physics does not appear in the State Course until the third year, that schools of the third class, where but one teacher is employed, should not attempt the study of Physics at all. Why enter upon any line of work unless the teacher has time to do it thoroughly? Scientific studies that require experimental demonstration must make large demands upon the time of the teacher, and in schools where the required time cannot be given, it is preferable that the study be omitted altogether. There is a tendency on the part of some teachers and boards to drag down into the first two years of a low grade school, several of the subjects which seem to require for mastery all the training and maturity of the advanced pupils of our best schools. Such a policy instead of strengthening the course, is a source of weakness.

In the schools that are teaching Physics now, there is quite a variety of equipment. Some have no apparatus at all and use a very elementary book, yet dignify the work done by the name Physics. Many others use a patent cabinet combination of many pieces in compact form. This has proved to be a ready seller and has enabled boards to convince themselves that they have fulfilled their duty toward their districts by providing an expensive "laboratory" for work in Physics. Undoubtedly this plan of providing laboratory facilities is much better than none, and in the small school has accomplished certain results, but it is also true that it is a debatable question, whether any board is justified in spending anywhere from $230 to $730 for that sort of apparatus. A third plan is in vogue in the best schools. Various pieces are purchased from time to time, to be used in illustrating the laws and principles of the more important topics in Physics.

The advantages of this plan are numerous. It is more economical; it is more serviceable. It requires less time on the part of the teacher, because his training and experience as a student, both in the normal school and college, have prepared him for it. It enables different students to work at the same time on individual experiments, and thus gives opportunity for true laboratory work. This method is justified by the experience and practice of all the larger schools. If it is the best for them, it is the best for the small school, provided the matter of expense does not forbid its adoption.

There is a great variety in the method of instruction in Physics and the plan used by the teacher will largely determine the kind and quantity of laboratory material needed. Some use a given text-book assigning lessons by pages, and generally succeed in developing a dislike for the subject. When undue emphasis is placed upon memory work in such a subject as Physics, no other results need be expected. In a large number of schools the teacher performs all the experiments while the pupils assume the attitude of observers, hoping to be entertained. Occasionally one or more pupils prepare and perform the experiment while the others observe and take notes. Probably in the small high school this is the best method, owing to the impracticability of having each pupil perform all experiments. Fairly good results can be obtained in this way if each pupil is required to keep a note-book record of all experiments performed during the course.

The educational value of practical Physics does not lie in the so-called discovery of laws, nor in the experimental demonstration of principles. Indeed, it is very doubtful if the small number of laws the student would be likely to discover, would adequately compensate for the large outlay of time that would be necessary owing to his defective powers of observation, and lack of skill in manipulation. Its value is to be found in the training it gives in attention to details, in the cultivation of accuracy in observing the smallest changes, in the formation of systematic methods of working, in developing the ability to reason back to a general law from a particular set of observations, and in cultivating habits of precise expression of ideas and principles on the pages of a note book.

To obtain these results and benefits from laboratory work, it is necessary to combine wisely both quantitative and qualitative experiments. Measuring with spring balance and meter stick must not preclude the studying of phenomena that are so full of interest and that arouse enthusiasm in the subject. There is a serious tendency to make the study too abstract and mathematical. An article in the June number of School Science and Mathematics by Prof. Willard Pyle makes the following statement: "Our pupils come to us with a surprisingly vague understanding of natural laws even though qualitatively expressed. What few definite notions they have about physical phenomena are often most erroneous. They all think that smoke settles on a humid day because the atmosphere is heavy, that the chimney draws air from the kitchen into the stove to make the draft, that an engine does work, that bodies in motion come to rest of themselves, that a horse pulls harder upon the wagon in drawing it than the wagon pulls upon the horse, that a body floats because it is lighter than the liquid or gas it floats in, that dew falls, that steam is visible, that ice is never colder than the freezing-point, that water boils because the heat continually drives the air out of it, that a perpetual-motion machine is a most reasonable thing, that ice keeps a refrigerator cold because the ice itself is cold, the melting of it being a most unfortunate thing, etc. They are almost as ignorant of the true nature of physical phenomena as the Irish servant who in the morning opened the shutters to let out the dark." Such conditions should be remedied by a rational method of teaching.

In addition to a good modern text-book in the hands of the pupils, I believe that a laboratory manual is essential. The teacher does not have time to dictate to his class, what can be obtained in so much better form. No manual need be followed slavishly and it is advantageous therefore to have several manuals available, so that comparisons and substitutions may be made. Many of the manuals give lists of apparatus and approximate cost for one set for the experiments published. Apparatus needed for class recitation work would increase this cost. These price lists range from $68 to $100. I believe that an adequate laboratory for a small high school can be equipped for less than $500. Any school teaching Physics should expect to purchase at least $200 worth of apparatus. Many pieces that are comparatively simple can be made by an ingenious teacher with the help of his pupils. The steam engine, dynamo, motor, pump, and derrick, may be taught by judicious visits to the machinery in actual operation. In my own teaching of Physics, the most interesting work of my classes was done in Meteorology. The equipment of a volunteer weather station involves comparatively small expense, and the work in practical Physics will amply repay any one who successfully conducts it.

Suggested List of Apparatus.

Mechanics.—Meter sticks, spring balances, Harvard trip balance (2), supports for trip balances, air pumps, force and lifting pumps (model), alcohol lamps or Bunsen burners, pulley system, wheel and axle, inclined plane with car, specific gravity bottle, hydrometer jar and hydrometer, barometer, mercury (4 lbs.), glass and rubber tubing (assorted), flasks, corks funnels, tools, etc.

Sound.—Sonometer, C and G tuning

forks, resonance tube, siren, rotating apparatus, etc.

Heat.—Thermometers, calorimeters, model engine (glass cylinder and chest), linear expansion apparatus (lever form), still and condenser, etc.

Light.—Prisms, lenses, mirrors, curved and plane, color disc, etc.

Electricity and Magnetism.—Bar magnets, compass, vulcanite and glass rod with good silk cloth and catskin, Toepler-Holtz machine, electroscope, Leyden jar, electrophorus, electric cells, dynamo and motor, induction coil, telegraph key and sounder, electric bell, galvanometer, volt-ammeter, horse-shoe electro-magnet, small incandescent lamp, etc.

This list is only intended to be suggestive. It may be greatly extended to suit the size of the school and the character of the work required.

Mr. C. D. Koch, State Inspector of High Schools, read the next paper upon the

EQUIPMENT FOR A SMALL HIGH SCHOOL WITH A REFERENCE LIBRARY.

There were in the United States in 1875 over 2,000 libraries, having more than 1,000 volumes each. In 1900, there were over 5,000 libraries, while the report of the Commissioner of Education for 1903 gives 6,869 libraries with a total of over 54,500,000 volumes. The progress of the library movement since that date has been very rapid and bids fair to show even greater growth in the not distant future. Notwithstanding the world-wide library movement, many of the public schools have been slow to provide the necessary equipment, as the High School Inspectors' reports show that comparatively few township and borough schools have any sort of library at all. We may infer, probably, from this that the people either look upon the library as a luxury or that they have not yet learned its true value. Since the State has appropriated so largely to the maintenance of the public school and has recently provided special aid for recognized high schools, and if the library is, as educators and public spirited men hold, one of the greatest of our educational forces, if it is truly a university as Carlyle has said, it may be regarded as the correlate of the public school and should be supported by public funds.

Assuming, then, that, with a new conception of education, we study subjects and not merely text-books: that the teaching of the right use of books is one of the most important purposes of the school: that the library is to assist the school in its work for its pupils through school life, and further and still greater than this, to give to the whole community the opportunity of continuing its education throughout life[1]—the library is an absolute necessity in our new scheme of education, I hope to show in a brief paper what the equipment for a small high school with a reference library should be, or at least help to make the question more intelligible for future study.

There is no doubt a difference of opinion prevails as to what constitutes reference books, but this may be expected. Roark, in his Method in Education, says: "For purposes of topic study, any book containing information on the subject under investigation is a reference book. Other text-books than the ones in use, cyclopedias, dictionaries, maps, railway folders, advertising pamphlets, magazines, newspapers, all are reference books." This definition will answer our purpose in this paper. Professor Roark says further "Of course, no institution from the grammar school up, that is worthy of its name, is without a reference library of some sort."

There is scarcely a vocation that does not require constant use of reference material. Doctors make frequent reference to medical works when in quest of a remedy for new diseases. No lawyer thinks of pleading difficult cases without careful consultation of books of authority. Ministers are safeguarded by reference to concordances, commentaries, and dictionaries of the Bible. Conductors on the train refer hourly to train schedules to know accurately the number of miles between stations and when trains make connections. Even freight agents, clerks of banks, editors, salesmen, insurance agents, and stock brokers must depend on works of reference. To both the professional and non-professional, reference books are time savers. What the teacher and pupils need is the habit of looking up information. The school must provide the means. One of the difficult questions in the selection of reference books is how to get books which will be most useful to the pupils. The arrangement of the material, an intelligible table of contents, and the language couched in such form that the students will have little trouble comprehending it, are of primary importance. Utility then is the first basis for the choice of a reference book. In most cases the purchase of separate volumes is preferable to buying sets of several volumes, written in too scholarly a style for the average reader. The most expensive book is not always the most serviceable. Again the character of the book is an important factor in choosing it

[1] N. E. A. Proceedings.

for a library. It must be interesting and inspiring, elegant in diction: free from defects of scholarship and vulgarity.

The high school pupils will find the reference library very helpful in correlating their work in English, History and Science. This must be a daily task, systematically outlined and regularly followed, otherwise the pupils will work at random. "At times references to some special book must be given for the students to look up. At other times particular references should be assigned for reading. Again topics without references will be in order."[2] The first and second of these methods will lead to definite school work, while the third gives the student more freedom in the choice of his material, calls into play his judgment in selecting what he can appropriate to his needs, trains him in the use of the index and gives a chance to handle books on the shelves, which is perhaps the very best library training. The reference books of first importance to the student, because most frequently consulted, are the dictionary and encyclopedia. Scarcely a page can be studied or read intelligently without reference to one of them. Next, likely, will be reference books on literature, history and science. These departments are rich in content, but it is locked in, so to speak, all for the want of library keys. We have, too, the atlas and gazetteer for geography and history, who's who? for biography, the world's almanac for statistics, books that aid in the interpretation of allusions and myths, books that treat of political and economic growth of nations, and those that tell us of the fine arts. All these the student will find helpful in his search for truth.

The equipment of a small high school with a reference library will be incomplete without a well-selected collection of pictures. A few master pieces should adorn the school-room. The pictures should be classified as pictures of places, of people, of nature, and of art. This collection can be increased by having the pupils make clippings from magazines, newspapers and advertising pamphlets. This sort of training, if the child is taught to discriminate, will have a permanent value to the student, in that he will always be on the alert for the best pictures. The first ones selected should be master pieces, such as the Angelus, Sir Galihad, the Prayer in Congress, pictures of ruins and buildings, the animal pictures of Landseer and R. Bonheur, and other famous pictures from the Flemish and Italian Schools of Art. To these may be added the best pictures of Washington, Lincoln, Tennyson, Shakespeare, and Longfellow. Good photographs of great paintings are of much greater educational value than those of unknown artists. This collection may also include plaster casts of Grecian sculpture. To get funds for the purchase of these pictures, Turner's and Elson's art exhibits will create sentiment in a community in favor of such expenditure and furnish means by which and a place from which to secure them. Graduates and patrons of the school will consider it a privilege to contribute pictures, if they know what is desired. The pictures need not all be purchased at one time. The collection should rather be a growth than one made up from lists compiled at random. "No one can estimate the refining influence a number of good pictures will have upon the formative period of life."

[2] N. E. A. Proceedings, 1907.

At this point I am led to digress a little from the subject but it has one definite purpose, and that is to correct, if possible, some common existing hindrances to good school work. I fully realize that it is not within the province of this paper to discuss many disconnected points, but I want to mention one or two.

The teacher of every high school with a library will do well to give instructions to pupils in the right use of reference books. The first year pupils will need this most, however, the grammar school grades will profit very materially from such instruction and use of reference books. "Instruction in the most efficient use of the library should form as important a part of the curriculum as instruction in language or history. It will exert a wholesome influence on the pupil's future career. This library habit makes possible the continuation of intellectual activity and progress after school life is finished."[3] Pupils should be taught how to care for books; how to open and close them; that they must learn the necessity of clean hands: that books must be returned to the case when through using: also instruction should be given in the use of indexes, character and scope of the preface, title-page, introduction, and table of contents. It will be interesting as well as instructive to give some time to the history of bookmaking. A brief talk on the character and different kinds of reference books will be helpful to pupils in running down subjects. In the Central High School of Detroit, Library instruction has been systematized in a highly satisfactory manner. Library and reference work is made part of the English Courses. One lesson a term is directed to literary aids.

Perhaps many will be more concerned

[3] N. E. A. Proceedings, 1907.

with the problems how to get the reference books than what to get. To me it seems entirely proper for boards of directors to provide them with money appropriated to the district for the maintenance of recognized high schools. We do not urge or even expect, at least in many districts, the purchase of all the books at one time, but that those most needed may be purchased first, say fifty, and the rest added as the funds permit. The library once started will move along and keep pace with other things. Other ways of procuring a library equipment are, by planning lecture courses, school entertainments, class or school plays, art exhibits and private subscriptions. The most essential thing is to get the library. Indiana requires for commissioned high schools of that State, a library adequate to meet all the demands for reference work and general reading supplementary to the regular text-books.

Having considered what constitutes reference books, their educational value, instruction in the proper use of them, and how they may be secured, it still remains to say something about the location of the reference library. The books should be in cases. These need not be expensive, though well proportioned and neatly finished, so that they will add to the school furnishings. A room adjacent to the high school room will probably be the most suitable place for the reference library. This may also be fitted up for office use.

The room should be well lighted, properly ventilated and heated to a temperature of 68° to 70°. The room should be furnished with a table and chairs for the exclusive use of those who want to consult the reference books. There should be a dictionary holder, newspaper racks, book supports, bulletin boards, paste, blotters, pen and ink, paper cutter, maps, globes, catalogues, etc. Should there be no room that can be used for this purpose, closely fitted cases containing the library equipment may be put in the high school room. They should be placed easily accessible to both teacher and pupils. The library must be kept free from paper litter and dirt. The floor should be cleaned frequently with soap and water, and the woodwork wiped with a damp cloth. Much depends on the neatness and order of the library.

The lists of books selected represent nearly all departments of secondary education. It was thought best not to choose too many lest confusion arise in the minds of some persons as to which books to buy. The list will serve to guide teachers and boards of directors in making purchases. It does not seem out of place for me to suggest that the teachers take up the subject of reference books at educational meetings. The lists will be much improved if many become interested in further discussion of the question.

Professor Ben C. Graham professor of Science of the McKeesport high school continued the discussion of the subjects presented as follows:

Before attempting to discuss the equipment of a small high school for Physics teaching it seems to me necessary at the outset to settle, if possible, what should be required of that subject in a school where but a limited amount of time can be devoted to it and the teaching is often done by an inexperienced and inadequately prepared teacher. Do not think that I am slandering the teacher of the small high school, but we all know that in schools of this class it is necessary for the teacher to give instruction in a large number of subjects and in many cases, owing to his inexperience, he lacks that knowledge of pedagogy and insight into methods so necessary in the skillful presentation to the class, of Physics, the most difficult subject to teach in the high school course.

By way of equipment he often has the text-book and but a few pieces of apparatus to work with. Consequently he must display greater skill and resourcefulness to accomplish results than his more fortunate brother in the city school whose laboratory is well equipped. With these conditions in mind in attempting to investigate the best manner of equipping the small high school it seems to me very fitting to first consider what we should expect of the Physics course in such schools.

Many of our high schools teach Physics so that their students can pass the college entrance requirements—and I believe that factor in college entrance has done more than anything else to raise physics teaching to the high standard of excellence attained in many of our high schools to-day —but in small schools where perhaps not more than five per cent. of the students pass on to the college, it seems both unfair and unwise to shape the course for the benefit of the smaller number. At first we place in the student's hand a text-book, any one of a dozen or more, and most of them good—in which he finds more material needing explanation, illustration, and demonstration than in any other text-book of the whole high school course. If we are preparing our class for college we will carefully explain what we think it is absolutely necessary for them to know concerning the text and then all the rest of our time will be spent in the laboratory, working strenuously to perform the minimum requirements of quantitative experiments

and carefully preparing a note-book with a complete record of this work. This leaves entirely unexplored a vast field of interesting qualitative work, and phenomenology, which the average boy is thirsting to know about. Consequently, Physics is classed by the majority of the students as dull and uninteresting. I am old-fashioned enough to hold that the first duty of the student is to get the text but before he can do so it must be made clear to him by the teacher, and before the teacher can make it plain he must have a large fund of illustrations drawn from previous experiences in the student's life and sufficient apparatus to demonstrate by experiment. In the assignment of each succeeding lesson the principles involved must be made plain by the teacher through explanation and experiment, and this means lecture table demonstrations. So then it seems to me that the first step in equipment of a small laboratory is a sufficient amount of apparatus to demonstrate satisfactorily the important principles of an average high school text.

This should include the following: A grooved plane sixteen feet long and a billiard ball to demonstrate the laws of falling bodies, a good balance, a vernier caliper, a set of spring balances, lever apparatus, a pendulum bob, an aneroid barometer, a good air pump and bell jar, a whirling table and attachments to show centrifugal force; a set of tuning forks, a small siren, and a sonometer; thermometers, and apparatus to illustrate linear expansion, specific heat, latent heat of fusion and vaporization, and distilling apparatus; plane mirrors, convex and concave mirrors and lenses, optical disk and projection lantern; magnets, dipping needle, electrophores, electroscope, Leyden jar, small dynamo motor, induction coil, plunge battery, simple cell, Daniell cell, dry cell, tangent and D'Arsonval galvanometer, resistance box, lengths of wire of different resistance, and Wheatstone bridge.

The foregoing is not an ideal list of lecture apparatus but it does contain the essentials necessary for class demonstrations and it seems to me to be the kind of apparatus that should first be placed in the small high school. Next we will consider apparatus for individual laboratory work, but first I wish to say that a student in high school who has never studied an experimental science hasn't any business with apparatus and a laboratory manual until after he has first seen his teacher perform successfully various physical experiments, both easy and difficult, and then has undergone a Socratic quiz until he has grasped every detail of the experiment and has thoroughly mastered the principle involved.

Our laboratory should be provided with sufficient apparatus so that the student can perform for himself at least thirty-five experiments such as those given in the National Physics Course or Milliken and Gale's Manual. There are other good manuals but I have tried both of these in the courses just mentioned and find them very teachable. If possible to provide enough apparatus so that all members of the class can work upon the same experiment at the same time I think it wise to do so, for it will save a great deal of time and energy and it will permit of the laboratory work being done by the pupils just as the work is taken up in the class-room. Where it is not possible to provide a sufficient amount of apparatus then the laboratory work should be taken up by dividing the experiments into groups and shifting pupils from one set of apparatus to another until all the experiments of the group are finished. Excellent work can be accomplished by the latter method but it seems to me the former is far more satisfactory.

From my own experience I have found it exceedingly difficult to convince schoolboards in small towns and townships of the necessity of investing money in physics apparatus, but the plan that I have found most successful is to secure an appropriation to start a laboratory on a small scale and then have a fixed amount appropriated each year. Three hundred dollars spent in a judicious manner followed by an appropriation of one hundred to one hundred and fifty dollars each succeeding year will in a few years build up a splendid working laboratory. Owing to the frequent changes in the teaching force I think it a good idea when this scheme is followed to make a careful plan for the purchase of apparatus at the very start. Let it be modeled after that of some good laboratory. Then if there is a change in the teaching force the development of a good laboratory will not be interfered with.

With a laboratory equipment such as outlined here it may not be possible to meet college entrance requirements at the start but, in the hands of a competent teacher it will accomplish what is vastly more important—the teaching of physics in such a way as to make it of surpassing interest to the average boy or girl, and, instead of finding it a drudgery and a bore from a perpetual grind of quantitative experiments it will become, with the frequent use of interesting qualitative experiments and illuminating demonstrations upon the lecture table, the most interesting study of the high school course.

THURSDAY MORNING.

THE department met at 11 a. m., Dr. Herrick in the chair. After some brief preliminary remarks, he introduced Mr. Irwin W. Williams, Deputy Commissioner of Forestry, who read the following paper upon the

NEED FOR THE STUDY OF FORESTRY IN PENNSYLVANIA AND WHAT IS NOW BEING DONE.

The State of Pennsylvania is so located that it contains within itself a complete section of the Appalachian range of mountains. The State is divided into three distinct portions, the low plain in the southeast, the high plain in the west and northwest, and the mountainous portions between with the accompanying foot-hills extending northeastwardly and southwestwardly across the State. Included within the third division are numerous lakes and farms, but the topography of this portion is such that a large percentage is non-agricultural land, varying from steep rocky mountain sides to table land. This portion is covered with some kind of forest growth.

Originally Pennsylvania was almost wholly wooded. Leaving out of view the surface of the lakes and rivers, the remainder of the State was once continuously a dense forest. In the process of reducing suitable lands to agriculture, much of the forest growth was removed, so that by the year 1850 it is estimated that 20 per cent. of the State was cleared, the balance consisting of forest. In the year 1900, or after a lapse of just fifty years, it is estimated that these figures had changed places, that 80 per cent. of the surface of the State consisted either of cleared land or land denuded of its tree growth, while not more than 20 per cent. of good forest remained. In other words, in a half century we have seen three times as much area of Pennsylvania forest uncovered as had been removed in the previous one hundred and fifty years existence of the Commonwealth. All this is easily accounted for. It is a fact well known and patent to everyone who is at all conversant with the subject.

But forest removal and forest destruction did not cease with the year 1900. It is going on continuously, and no doubt will go on until the last of the merchantable timber is removed from the State. We will then have remaining nothing but the farmer's wood lots, which always contain a fair percentage of merchantable trees, and the second growth which has sprung up on non-agricultural lands since the removal of the original forest. In cases where the lumbering was done thirty or forty years ago, the second growth is already in process of removal, and this time the removal is complete. After the lumberman has his wants satisfied; after the tannery has had its quota of bark; after the pulp mill man, the mine owner, and the railroad builder have taken their shares, there will remain on the land in many cases absolutely nothing, while in others, everything will be gone but the two or three inch saplings.

Pennsylvania, like al the other States of the American Union, has been prodigal of her wealth. She has had such an enormous abundance of it that for a long time the thought has been extant that the resources of the State are inexhaustible; and that anything looking toward the saving of waste, or a conservation of supply, or the providing of a new future supply was viewed with pitying toleration, as an idea wholly impracticable, useless, and chimerical. To-day, there are those even who say that nature will supply our wants in the future as she has in the past, that nature will take care of her own, and that she needs no assistance, that wood will continue to grow faster than man will use it, and that any propaganda relating to forests and forestry, undertaken for present benefit or future generations is a waste of good effort and better money and something that they cannot for a moment countenance. And all this in the face of the proved facts, that Pennsylvania is using her timber about three times as rapidly as it grows, that her mountains and plateaus are in some instances being reduced to what anywhere else would pass for a desert, that her water supply and stream flow is being disastrously affected, that the price of wood products has reached almost prohibitive figures, that we must now look to the south, northwest, and Canada for lumber we cannot obtain at home, and that there is disappearing from the State one of its most valuable industries. It seems little short of marvelous that persons, either through ignorance or prejudice, are thus able to dim their vision or fail to be affected by what in any other business or avocation might be sufficient to give rise to apprehension or cause alarm.

Starting therefore with the premises that lumber is almost ruinous in price, that for every three acres cut over each year nature restores but one, and that our towns and cities are being put to great inconvenience and large expense by reason of their water troubles, we approach the question, Is there a need for the study of Forestry in this State? Or in other words, is there a need for a real serious businesslike consideration of special economic problems affecting every citizen either directly or indirectly, to the end that some solution may be reached by which it will be possible to continue the State in the rank she now holds, or formerly held, as a rich, vigorous, producing, independent, self-assertive Commonwealth?

Forestry may be said to be both a science and an art. The science embodies the principles, while the art includes practice in their application. It is a study with many ramifications. It leads into numerous and frequently unthought of channels. For its basis it has the study of the tree and of tree life. Starting with this unit it is compounded and recompounded until we have included within it numerous economic ideas all of which need to be better understood. Our people have been so deeply engrossed with the material prosperity side of their lives in taking down instead of building up, that forestry to-day is in this State a comparatively new idea. A wider acquaintance with the principles and practices of forestry and a deeper desire to

know better what it teaches would certainly be productive of lasting benefit, to the State in its corporate capacity and to the individual as well. For while it is true that forestry may best be practiced by the State existing perpetually, it is equally true that the results accruing therefrom are for the pleasure, profit, and well being of every citizen who helps comprise the State.

What shall be done with our hills and mountains now stripped of their merchantable timber? Shall they be permitted to remain as to-day without protection and the prey of every element, or shall they be included in one comprehensive scheme which looks to the restoration of a forest cover, this to be composed of such species of trees as will in the shortest time yield the largest returns? There are some parts of Pennsylvania, which if left to themselves, would not and could not grow a respectable tree cover in a thousand years. They have been stripped and burned and gashed and seamed, so that natural regeneration is out of the question. But the study of forestry will teach the owners what a great waste, what a loss of opportunity. It will teach railroads and mine owners that timber suitable for their purposes may be reproduced where once it existed; it will teach the merchant and mill owner that after a lapse of reasonable time it is possible again to have at their very doors a simply of timber, to procure which now means expense and much delay; it will teach the farmer that in his woodlot its principles may be applied to the betterment of the farm and the saving of many dollars; and it will teach whole communities that to have a bountiful supply of good water, it is necessary to protect the hillsides from erosion, to retard rapid surface runoff, and to have a suitable filter through which his water supply may be relieved of its impurities. All this may be accomplished by judicious protection, restoration, and administration of the wooded cover in places where agriculture cannot be practiced.

Forests are necessities to every country. To attempt to live as we know life without using wood, would not only be highly inconvenient but well-nigh impossible. The benefits derived from the forest are in every way so essential to life, that in the absence of them all human existence would be reduced to a low ebb. There are places in the earth which once were well wooded, well watered, and well populated. They have been cleaned of everything that resembles a tree. Waters have disappeared, birds have left, and even the rains seem to descend less frequently. The land has been reduced to that condition which we call a desert. This is true of the interior of China, it is in part true of Palestine, and it is true of the Dalmatian Mountains. If the presence of the forest is in every way so essential, is not the study of the forest and its influences a pertinent subject, for the neglect or disregard of which we can frame no just or adequate excuse?

In continental Europe the study of forestry has been followed by forest preservation and utilization and it has become one of the recognized courses in any scheme of a liberal education. In America we have just awakened to the fact that if there is to be preserved to posterity what to us has been a precious inheritance, a part of the work must be accomplished through the study of the principles and practices of forestry.

Our educational institutions have been slow to add forestry to the recognized courses. This has been due largely to the three causes of ignorance, indifference, and inability to procure talent to handle the subject capably.

For fifteen years the Commonwealth of Pennsylvania has been alive to the idea that it must begin the work of forest preservation and restoration. In the year 1893 the legislature authorized an inquiry into the subject, and the report of the Commission appointed to investigate, presented to the legislature in 1895, opened the eyes of our statesmen and some of our people to the necessity of beginning at once. From that day forward the forest policy of Pennsylvania has been a model for other States, and it still maintains the lead then assumed. It was also realized that the State could best undertake that which, while highly desirable in the individual, offers less encouragement than many other fields of endeavor.

Land was purchased to be erected into forest reserves in the year 1898, after due legislative authority, and the first tracts were bought at County Treasurer's tax sale in the neighboring county of Clinton. In that county the State has since acquired and now holds 90,000 acres of excellent land for the purpose. Much of it is well set with timber to be used in the future as necessity demands. In addition to the holdings in Clinton county, the State has made purchases in twenty-three other counties, and now holds in actual ownership 780,000 acres purchased and paid for, with probably 125,000 acres additional pending purchase during negotiations. The State has entered upon a real course of forest preservation and restoration. Of forest preservation because she protects what she holds, and of restoration because she is prepared to plant young trees upon the areas, which by reason of unfavorable treatment received could not of themselves re-establish a forest growth.

But forestry comprehends more than the mere purchase and protection of woodlands. It is not enough simply to have. There must be coupled with ownership wise usage, and unless such use be made of the forest it is not brought up to all the requirements of the science under which it is managed. The State of Pennsylvania realizes that with forest holdings it must have forest management, and the forest management we demand is not the casual hit or miss method too frequently employed in this State as elsewhere; but management by the trained specialist, who must be able to read his woodland like the page of an open book, calculate what its possibilities and probabilities are, determine the system best adapted for particular areas, and to lay out and sub-divide his work in such a way that it can be handled most economically. He must be able to calculate almost to a nicety, as with an actuary's table, what will be the expectation of his reserve, and to shape all his

plans to produce the desired end. Scientific management of a forest reserve is a complicated proposition in Pennsylvania, where our forests consist almost wholly of mixed wood. Add to these the collateral branches of the subject, and we have problems arising which involve protection from fire, laying out of roads and trails, the protection of springs and water courses, questions relating to grazing, hunting, fishing, and general recreation, the best use of mineral wealth, if any, and the diplomatic handling of questions which arise between the forest manager and the people in the locality. In short, a forester upon a Pennsylvania reserve must be a man of sound business sense, with an intelligent grasp of his subject, a broad gauge man who will view his work from a business point of view. His endeavor will be to make it respond to the needs of the State and become a self-sustaining pay-as-you-go proposition wholly dependent upon results.

It has been stated that the best man to enlist in the management of a forest reserve is the lumberman, and that every condition would be met if the State were to engage practical lumbermen to manage her forest reserves. No statement could be more wide of the truth. The business of the practical lumberman is to cut down the woods and make from them the greatest possible immediate profit. No tree to him is worth very much until it is upon the market or on the way there. He measures its full value by the number of dollars received in exchange for it. This kind of management is not recognized by the science of forestry. Foresters look to the future as well as the present. The practical lumberman is out of the case so far as the technical forest policy of this State is concerned. To buy large areas of land and do little more than that, as at least one of our sister States is doing, would not do for Pennsylvania. She had to have trained men and they were not to be had. The educational institutions of the State years before, or as the reserves were being developed, might have been educating men for this purpose, but allowed their opportunity to go by, so the Department of Forestry was compelled to start a school wherein young men were placed in the first instance to be trained as rangers or protectors upon the reserves, the hope even then being cherished that some Pennsylvania educational institution would assume the duty of turning out the foresters. When these were not forthcoming it became necessary to broaden the course at the Mont Alto Academy to a full-fledged forestry school, which to-day it now is with its corps of professors and students hard at work preparing the young men for future employment on the State reserves.

Under legislative authority the Mont Alto Forest Academy was established in 1903. It was the first institution in Pennsylvania to teach forestry, and is to-day the only institution in the United States under State control carried on by direct State authority and State money, existing solely for the purpose of teaching the science and art of forestry. The faculty at present consists of five persons, all of whom are college or university graduates, while the student body numbers thirty, three classes of ten men each, appointed for a period of three years. All appointments to scholarships in the State Forest Academy are determined by competitive examination, and only citizens of this State may apply. Applicants are subjected to a rigid physical examination to determine their fitness for the work, and this being of a long sustained and arduous character must needs be backed up with excellent health and a fine constitution. The examination in scholarship comprises ten different elementary subjects, and is made especially rigorous so that those chosen shall be well-grounded before entering upon the technical part of their study. The examination is conducted by a board selected by the Commissioner of Forestry. These gentlemen prepare the questions, mark the answers, fix the grades, and report the result of their findings. Every applicant has an equal opportunity with every other. Political influence and favoritism are not countenanced for a moment. That the young men who apply feel that this is true is best evidenced by the fact that for the eight places to be filled this year fifty-five applicants from 25 counties presented themselves last week at Harrisburg.

At the Forest Academy the young men are supplied with everything except their personal clothing and horse and riding outfit, which latter must be procured during the second year. The State gives the student everything else and cares for his horse. The students' horses are always at the service of the State, and must respond to any demand that may be made upon them. An efficient fire patrol service has been organized with men assigned to regular stations. Should an alarm of fire be sounded from any part of that reserve at midnight, within twenty minutes after the bell is struck, every man would be mounted and in his place ready to start for the burning woods. There is at Mont Alto a Pennsylvania fire wagon, a four wheeled vehicle, especially built for the purpose, equipped with tools, water kegs, force pumps, medicine, rations and horse feed, kept under lock and key, and ready in an instant for any emergency. There is also here the fire pack train for fighting fire upon the steep hillsides, a device which has frequently been tested, and in every instance proved its worth. Both of these are believed to be unique. We do not know that they exist or are in use in any other part of the world for this purpose.

A student on entering the Forest Academy at Mont Alto enters into a contract with the State that he will take the full course of three years at the Academy, and then serve the Commonwealth at least three years as a forester within the reserves. During the latter period of three years he is paid a just and fair compensation. To hold a student to his contract, he is required to furnish a bond in the sum of $500 with approved surety, conditioned that the terms of the contract will be observed. Any young man without stability of character or a good reputation in the community in which he lives could not possibly meet these requirements.

Consequently the students of the State For-

est Academy are a class of high grade substantial young men. Some have already gone out from the institution as foresters upon the reserves. They are doing their work in an intelligent and business-like manner, giving a good account of themselves, and which we expect to be continued by those who may be sent out from time to time. The work at the Academy occupies practically the whole year, a short vacation only being allowed in the latter part of August and about the time of the holidays in each year. From November to April the work is mainly within, while from April to November it consists of practical work in the adjoining forest reserve of 42,000 acres, wherein may be found almost all the diversified conditions likely to be had anywhere in the State. This Academy by reason of the work it is doing, by reason of the men it is fitting and has fitted for managing reserves, and by reason of the demand for just such men, has earned its full right to exist, with the expectation that as it grows older its course will be better, its entrance requirements raised, and its work in general be made equal to that of any similar institution in the United States, as indeed we think it is at this time.

The course at Mont Alto leads to the degree of Bachelor of Forestry. In the first year in addition to some elementary work the introduction to forestry is begun, and is followed by the regular standard forestry courses in physics, book-keeping, business law, elementary civil and criminal law, civil government, botany, chemistry, physiography, trigonometry, meteorology, geology, political economy or practical economics, dendrology, sylviculture, forest protection, wood technology, wood utilization, forest mensuration, road building, the study of soils, German, zoölogy, forest finances and policy, surveying, and forest management and working plans.

During the first year summer term nursery practice is had in the adjoining forest nursery, and the student is also engaged in plantation work and practical labor on the reserve.

During the second year summer term he is given practice in marking trees for thinnings and improvement cuttings and laying out trails and roads.

During the third year summer term he is engaged in practical work in surveying, leveling, and mapping, and work in forest administration.

The Department of Forestry awards students a piploma or certificate of merit, and at the end of the third year's summer term assigns them to permanent stations within the reserves.

The discipline maintained is exact, and while the rules for the government of the student body are reasonable and few, they are literally executed in every instance. The working day the year round begins at 6 a. m. and closes at 10 p. m. with reasonable intervals allowed for meals and recreation.

The Pennsylvania School of Agriculture and Experiment Station or State College, where we are assembled to-day, has long had in contemplation the establishment of a school of forestry. It began its real active operations in the fall of the year 1907, and is thus about a year old. It is under the very efficient charge of Prof. Hugh P. Baker, a graduate of the Yale Forestry School, and the work he is carrying on here is of the highest grade. The course is divided into four years, to correspond with the four years of the general institution work, the first two years being devoted to general collateral subjects in preparation for the more technical course to follow. In the junior and senior years the work is largely forestry, in fact almost the whole of it, and includes forest protection, mensuration, history, administration, and physiography, diseases of trees, forest management and finance, lumbering, wood technology, timber physics, forest law, principles of irrigation, business law, and other courses in related economic subjects. The course leads to the degree of Bachelor of Science, and there will be a post course in which a Master's degree is offered.

This school of forestry has established a small nursery, is conveniently located near one of the large State Forest Reserves, a solid body of land of nearly 300,000 acres, and is also near one of the large State Nurseries at Greenwood in northeastern Huntingdon county. During the past year Professor Baker has had in his courses students to the number of twenty-seven. He has brought together a small and well-equipped working library, numerous specimens of wood, and is now actively preparing for the coming year wherein his students will be given enlarged opportunities to acquire a forester's first class education. One of the special features of the work here is the course in farm forestry, a most essential adjunct to the work of applied agriculture. The farmer's wood lot is being recognized more and more as one of the valuable features connected with the farm. A knowledge how best to use a wood lot is highly desirable for any one who expects to teach or to apply the principles of practical agriculture. This is a subject which heretofore in Pennsylvania has been wholly neglected.

At Mont Alto, the instruction is purely scientific forestry for the education of foresters to be employed upon the State Reserves. At present the reserves are not sharply defined, and the young foresters have in many instances areas far too large to administer. As development proceeds and an increased number of men is available it is expected to create divisions ranging in area from 8,000 to 12,000 acres for each forester, or an average of 10,000 acres to a division. At this rate the present State holdings would require a force of more than seventy-five foresters, whereas, we have but twelve in the field, and not more than ten may be sent out each year, unless the capacity of the Academy be increased. At the present rate of purchase it will be many years before the student graduates will overtake the State's holdings. This being the fact, there is room for foresters in the employ of the State beyond the capacity of the Academy to supply. The forest restoration work of the Commonwealth is not limited to graduates from Mont Alto, but students coming from this State institution primarily established for the purpose indicated and for that alone, will be given the

preference. There is here no opportunity for farm forestry, such as is furnished by State College, neither is there opportunity for the students to take a post-graduate course or special work in political economy, constitutional law, history, physiography or plant breeding, all of which are exceedingly useful to the forester, and all of which are offered by the State College course. The opportunity in Pennsylvania for professional foresters is by no means confined to the State Reserves. While it is hoped in the future to increase the reserve areas far beyond their present size, —the Governor of the Commonwealth says we should have six million acres,—the increased attention now being given to forestry by railroad corporations, mining companies, paper manufacturers, pulp wood growers, farmers, and timber producers generally, will create a demand for foresters probably in excess of the number which the State will ultimately employ. And, then, there is the office of consulting forester, a man who offers his technical knowledge to those who occasionally need it but do not require his steady service, who will be prepared to give advice, make examinations and reports, and work at such problems as from time to time will be sure to arise, and which the forester under regular employment will be unable to care for. It would therefore seem that there is a real need in Pennsylvania for the study of forestry. The real need exists first in bringing to the minds of our millions of people a just realization of the problems involved in forestal subjects, and then when public opinion has advanced to such a point that its demands must be met, those who are equipped for the work will be sure of steady remunerative employment in a business most healthful, clean, and beautiful within itself. Public opinion is one of those sluggish things with regard to some subjects which drags on slowly for a time, and then suddenly seems to spring into most violent activity. This may or may not be the case with forestry; but the fact remains, that forestry has come into Pennsylvania to stay, that it has come for its highest, best, and most legitimate purposes. The institutions named are doing their part toward preparing men who will fill the positions to be created and who will meet the demands sure to arise. It is true that the Mont Alto Academy has not yet prepared sufficientt men to care for the State holdings, but this whole subject has been of slow and gradual growth. It is better to proceed thus then to undertake *per saltem*, to meet the full demand at once. It is equally true that the State College School of Forestry is probably not educating trained men fast enough to take the places awaiting them. Here also it is bettet to make haste slowly than suddenly to overcrowd the profession and then have its men placed at a disadvantage.

The question now arises, Is it necessary that schools for the education of trained foresters be increased in number? This is indeed problematical. While it is recognized as wholly desirable to have instruction offered in our various grades of schools on subjects pertaining to the science, it is probably true that the institutions named will be able for some time to come to take care of the most serious demands for such professionally trained men. There are other schools in the State wherein instruction in forestry is given by lectures and field excursions. This is most commendable. It serves to direct public attention in the right direction and at least offers a vista to the student. But no pretensions are made toward final equipment for the profession.

It must be patent to all that at some time in the future history of the world, if the human race continue to exist as at present constituted, many of the natural resources of the earth will be exhausted or seriously depleted. When the known supply of precious metals, of coal, iron, and oil are consumed, nature will not renew the stock with fresh material. We at least believe this and know of no natural laboratory wherein with the subtlest of alchemy this may be achieved. There is one natural product of which this is not true, the forest. Where forests once grew, unaided nature, if not interfered with, will reproduce some kind of forest growth; but aided by the skill and experience of man she will bountifully respond and amply repay for all time, money, patience, and labor expended in this behalf. How important than is it to know the truths which underlie these facts and how necessary to be forearmed in the world-wide struggle for existence that we know is becoming more intensified. All this, in part, is at least contributed to by the study of forestry.

The second paper of the morning was by Prof. Hugh P. Baker of the department of Forestry of Pennsylvania State College, upon the

TEACHING OF FORESTRY IN HIGH SCHOOLS.

It is hardly necessary to say to an audience of Pennsylvania teachers that the saving of our forest growth and the holding of valuable soils on our hillsides is absolutely necessary for the future welfare, if not existence of our State. The efforts of our State Forestry Commission so well shown in the establishment of State Forest Reserves of nearly a million acres and the organization of a strong forest academy is conclusive evidence that our people are waking up—though all too slowly. We are all perfectly familiar with the destructive effects of floods, most of us having personal knowledge of the loss of property, if not of life, by floods which may occur now at any season of the year as the result of heavy and continued rains. The losses from floods in this State alone during the past two decades would more than pay for the increasing of our reserved acres to several million acres and their thorough and competent administration for more than a decade. From a commercial standpoint our magnificent forests are practically gone and our best soils are being washed into the sea at a tremendous rate, yet how little our people really know of the present and future supplies of our natural resources. They apparently care little about trees, the forests or the benefits which may accrue to our State and nation by proper forest administration.

Through persistent agitation on the part of

the few rather than the many, there is an ever-increasing demand throughout the Nation for a more thorough knowledge of the extent and condition of our natural resources, and for trained men who can prevent a timber famine by carrying out more conservative methods of utilization and the production of new forests by natural or artificial means. Should not the absolute need in every State as evidenced by the condition of our markets and the demands of our people be sufficient cause for the introduction of Forestry in our primary and secondary schools?

In a recent meeting of the Governors at the White House, called by President Roosevelt for the purpose of considering the conservation of our natural resources, warnings were sounded by men prominent in every profession and every line of business. Mr. James J. Hill, President of the Great Northern Railroad, in a significant address before the convention said in part, "The sum of our resources is simple and fixed. From the sea, the mine, the forest and the soil must be gathered everything that can sustain the life of men. Upon the wealth that these supply must be conditioned forever, as far as we can see, not only his progress, but his continued existence on earth. How stands the inventory of property for our own people? The resources of the sea furnish less than five per cent. of the food supply, and that is all. The forests of this country, the product of centuries of growth, are fast disappearing. The best estimates reckon our standing mechantable timber at less than 2,000,000,000,000 feet. Our annual cut is about 40,000,000,000 feet. The lumber cut rose from 18,000,000,000 feet in 1880 to 34,000,000,000 feet in 1905; that is, it nearly doubled in twenty-five years. We are now using annually 500 feet board measure of timber per capita, as against an average of 60 feet for all Europe. The New England supply is gone. The northwest furnishes small growths that would have been rejected by the lumberman thirty years ago. The South has reached its maximum production and begins to decline. On the Pacific Coast only is there now any considerable body of merchantable standing timber. We are consuming yearly three or four times as much timber as forest growth restores. Our supply of some varieties will be practically exhausted in ten or twelve years; in the case of others, without reforesting, the present century will see the end. When will we take up in a practical and intelligent way the restoration of our forests?"

Is it not time that the newer generations, who will be forced to meet problems which are at least not of absolutely vital importance to the outgoing generation, be given instruction and training in the nature of our natural resources and how they may be conserved for the benefit of all the people of our great Nation? This is an obligation, a duty to our country which those who control our educational systems cannot afford to overlook.

No one will question the well-known fact that but a small proportion of those who enter our high schools, even though successfully completing the work there, enter college. To a surprisingly large per cent. then of the pupils who go from the lower grades into the high school it is a finishing school, the last preparation for the serious business of life. And even though but one in a hundred goes from our high schools into college, how tenaciously we cling to the old courses outlined for the benefit of the one rather than for the preparation of the ninety-nine. In view of the ever increasing complexity of our economic and social problems and in view of the rapid depletion of our natural resources, is it not of tremendous importance to the welfare of our country, as well as of the individual citizen, that we pay more attention to the ninety-nine who will eventually absolutely control this country—its political, commercial and social life?

To a marked extent the character of work done in a trade, a profession, in business depends upon the training school which to an ever increasing number through the country is the high school. If the courses of study in our high schools are overloaded and the number of teachers too small, the work perforce is superficial and our young people who are finishing their education are pushed hurriedly through subjects which mean little to them in school and less to them when applying for positions in a business house or with some large manufacturing plant.

President David Starr Jordan, in an address delivered before the California State Teachers' Association last year, quotes and sanctions the following: "The weakest part in our educational system is the high school. It hasn't time to do anything very well; hence it may be well to try to do fewer things, thus saving time to do some things better." There is no one here who has ever had anything to do with the planning and carrying out of high school work who does not wish for some one somewhere, who would decide what things could properly be excluded and what more fully emphasized that our high school graduate might be more thoroughly prepared for life. While it is probable that there is great lack of unity and definiteness in the work of our high schools, yet tremendous advancement has been made and each year these schools are establishing new standards and turning out more thoroughly equipped men; but in the face of both our tremendous industrial needs and our actual physical welfare more changes must be made.

The introduction and rapid extension of manual training is holding many young people in the schools. The right kind of nature study in our primary schools is making the years of this work much more attractive. This nature study should be followed in the higher grades by an increasing amount of the natural sciences, and this on through each year of the high school. What these sciences shall be will be determined by the general standard of the school, by the industrial needs of the community, and the needs of the classes of students in the schools—one might go farther and say the needs of each individual pupil, to which we are yearly paying more attention.

There is absolutely no question but what our natural resources are in such condition that something must be done and that soon if

our present industrial and physical welfare is to be maintained. Little can be done until the average voter is in sympathy with the work of conservation. As only one man in a hundred is a college man, we come again to the ninety-nine who are our average voters and will eventually control the attitude of this country toward industry and wealth. With these facts before us can we begin too early to teach the ninety-nine how to conserve our natural resources and to love the trees and all that they represent? The study of forestry could well begin in the primary schools, making it a part of nature study work and later of geography, history, botany and manual training as well as of agriculture. It is probable that it should at first be made a part of agriculture. Below a suggestive course in forestry for the high school is outlined for consideration. This is presented not only because of our industrial and physical needs, which are of tremendous importance, but also because of its influence upon the real every day lives of our people.

During two years as a public school teacher and for the past four years in college work every opportunity has been given to find out how much the average boy knows about trees and outdoor life. It seems to me that something is wrong somewhere when not one boy in a hundred knows the common names of more than eight or ten of the trees with which he has been surrounded all his life. They have grown up with trees and whether they know it or not the trees have had considerable influence upon their development. Even young men who come to college after having had more or less of botany in our high schools know little or nothing about the trees as they grow in nature. Take a thousand men on the street, and it will be safe to say that not more than twenty-five or thirty would know the common names of a half of the trees native in the State. And what does all this mean? It seems to me that our boys and girls are losing or have lost one of the factors in life which may control to a large extent their everyday contentment and happiness, if not their success. What a long, joyful, easy world of promise looms up before the healthy youngster! But we push him through school, pull him through high school and cram him at college, and as he goes forward with his education he sees everywhere about him the rush and struggle for money. Can we blame him for forming a wrong ideal of life, for placing above all things a chance to win in the lottery of politics, or making a short cut to a big income and a permanent place among the five hundred of his town? How often our young men leave the high schools and colleges to begin the struggle of life, and, although fairly successful as the world puts it, they sacrifice themselves to these ideals and there is never peace and quiet satisfaction as a part of the inner life. Nothing attracts the man but his game of life or his so-called pleasure, and there is nowhere to turn for the relief, the rest which every sane active man must have. Much can be done toward relieving and modifying this condition, especially among those who must live in our cities and towns, by creating within the child at an early time the desire of knowing the trees well and through the trees other things in nature. If this desire is united with the other desires of life there will be love for the trees and when the fight of life is hardest and most hopeless, this love of something outside of one's self will give the calmness and strength which one cannot help feeling and absorbing when alone with the great oaks, sturdy beeches and graceful elms of our woodlands,. Few of those without a college training and all too many who have it, do not have resources within themselves, such as a love for and knowledge of good literature, music and art, upon which to fall back when there comes little of cheer and encouragement from the outside. Knowing the trees and loving them will make one keep his eyes turned upward to drink in their beauty of outline and silent strength—and if one's eyes are upward turned, can one help seeing blue sky?

From the teacher's standpoint, there are very few subjects which offer greater wealth of material for illustrative purposes than forestry. This material is everywhere about us—from the seed and seedling to the tree and the finished product whether that be food, paper, parts of clothing, or the houses in which we live. Intense interest may be awakened in the pupil as he follows out the different phases of the subject; love for the beautiful, frugality, dignity and love for the other man—the essentials of patriotism of the right sort. An ideal is given which may be carried through the public school into college and beyond. As never before this country is believing in the ideal of honest public service or love for the other man. Is there a higher form of patriotism than this? It seems to me that there are few ways in which this all important training may be begun than in this study of trees and completed in a study of their tremendous importance to our national development and existence.

Already text-books for primary schools are being so revised that as the pupil studies geography, history, civics, or nature study and agriculture he will be given more or less of forestry. But if this has not yet occurred it will not be a difficult matter for the enthusiastic teacher to begin the work at once. There are working outlines and an abundance of material—what more is wanted? As a continuation of such work in the grades, I wish to suggest the following brief outline of a course in elementary forestry for our high schools. The various subjects suggested would not be considered at length or in a technical way.

Forest Influences or Relations.—Influence of the forest upon wind currents and their velocities, upon evaporation from a water and soil surface; upon rainfall and snowfall and their retention in or on the soil; upon the movement of the soil by wind or water; and finally upon the atmosphere, its humidity and temperature.

Forest Distribution.—The main forest areas of the earth with suggestions as to causes for the formation of desert and treeless areas. The principal forest divisions of the United States and local distribution over the State. Interesting examples of local distribution may

be found anywhere in the State. Suggestions as to how man can control distribution.

The Origin and Development of the Tree and the Forest.—How trees may arise from seeds sprouts, etc. The parts of a tree and their form. The struggle which goes on in the forest and how man may take advantage of this struggle by aiding the best individuals of the most valuable species. How the struggle influences the form of the tree. Seed production, collection, curing, storage and planting.

A Woodlot Study.—Take some definite woodlot and study its formation by natural reproduction either through seeds or sprouts and decide which method of reproduction would be better for the owner to follow in improving the woodlot. How the trees are grouped and what effect the grouping has on size and form. What effect removal of trees has on those left. What improvement cuttings are and how they may be used. What the selection system of cutting is and whether it could be of more value than clean cutting.

Protection of Forests.—From fire, grazing and trampling, trespass, game, smoke, gas, etc. The study of the trees in the woodlot will show how the trees might be injured in different ways, what kinds of fires there are and how to combat them, etc.

Forest Utilization.—How forests are lumbered, what is produced and what the various uses for wood. How our present lumbering methods may be bettered and what to do with the forest land after it is lumbered.

State and National Forestry.—What our State and Government are doing to protect and perpetuate our forests. Briefly as to the history of the movement in this country and in Europe. Brief resumé of the laws of the State which deal with forest protection and perpetuation.

At all times during the study the pupils should work with and among the trees, studying their characteristics in summer and winter and becoming thoroughly familiar with them. Experience has shown that pupils of high school age readily grasp the various topics outlined above when such are prseented simply. and untechnically. A great deal of illustrative material is everywhere accessible and while satisfactory text-books are not yet published there are many excellent government publications which may be had for the asking. The United States Forest Service publishes every month or so a list of its publications which are available for distribution. This is gladly sent regularly for the asking. Every teacher interested should apply for the following publications, published by The Forest Service, Washington, D. C.: Bulletin 24, Parts I and II—A Primer of Forestry. Circular 130—Forestry in the Public Schools. Circular 140—What Forestry Has Done, and Circular 36—The Forest Service; What it is and how it deals with Forest Problems.

Prof. Leslie B. Seeley, of the Northeast Manual Training High School, Philadelphia, followed upon the general subject of

FORESTRY IN THE HIGH SCHOOL.

It seems to be pretty well understood that whatever work in forestry is done in the high school shall be of a general nature and not for the purpose of training men for the practice of forestry. This is right. The production of trained foresters should be left to trade or professional schools especially located and equipped for the purpose. The arguments in favor of this proposition are so numerous and so apparent that it would not seem necessary to enter into a discussion of them.

But if not to train foresters, what should be the object of such a course of study. It should be two-fold—cultural and economic. Like all the natural sciences, the study of forestry should be made to possess for the student a definite æsthetic value. It is peculiarly adapted to this purpose, for both the individual tree and the forest as a whole are full of beauty; and they typify in an unusual degree those elements of character which we most admire in men. With proper guidance the student will draw many a lesson of grace and beauty from certain of the forest trees, while from others and from the forest as a whole he will get an inspiration of quiet rugged strength found nowhere else in nature. As the home of many forms of animal life the forest will make a lively appeal to the interest and imagination of the boys and girls of the high school age.

It is not however the cultural value of forestry which is at the present time so strongly recommending it to a place in the public schools. For the past eight or ten years there has been going on a remarkably earnest and successful movement for the spread of a general knowledge of forestry with regard to its economic value, and it is largely the result of this movement which is so strongly recommending the adoption of the study into the high school curriculum. How great and how pressing the need is in the State and Nation for careful thought and widespread instruction in this subject has been fully treated in the papers preceding this discussion. It would seem to be imperative that concerted action be taken immediately by every agent which should minister to the public good, to prevent an irreparable calamity from a condition already appalling. At the same time let it be borne in mind that there is a definitely cultural side to the subject which should not be lost sight of.

A course of study taking into account the two phases of the subject I have mentioned would, I believe, have some very definite and desirable results. First, the forest would become a thing appreciated

and understood by the student, and this in itself would go far toward solving some of our hardest problems growing out of the relations of the individual to the forest. Carelessness in the matter of starting fires would be greatly diminished, and the cutting of timber by land owners would be more intelligently done. Then too, there would be a great growth in public opinion which would care through legislation for the lands already cut over by private and corporated holders. This same public opinion would favor an intelligent, progressive policy in regard to national and state forests, until our watersheds are adequately protected, and great tracts now lying idle and unproductive are again reforested.

The question as to how this instruction shall be given in the high school is still an open one. Shall it constitute a separate course in the curriculum or shall it be given in conjuction with courses already established? Both plans seem to have their objectionable features. By the first we are confronted with the problem of a curriculum already much overcrowded, and it is doubtful whether enough time would be given to a separate course to really do the work efficiently. By the second plan we would have many teachers (this would be especially true in schools where departmental teaching holds) giving instruction bearing on the same subject, and problems of co-ordination and continuity would immediately arise. The national Bureau of Forestry in Circular 130 favors the latter plan. If proper superintendence of the work is maintained this would seem preferable, especially as the work could be begun in the Nature Study of the lower grades and its continuity preserved. A very strong argument in favor of a separate course is the greater ease with which the work could be made intimate and definite. For good results this must be insisted upon with either plan. Allow me to illustrate what I mean by intimacy and definiteness by a case in point. Take the statement that destructive floods alternating with drouths are the results of excessive destruction of the forest cover in the drainage areas of the streams in question—a statement very naturally in order in a discussion of physical geography. Now, unless that statement has been preceded or accompanied by something additional, it will remain at best to every boy and girl, whether country or city bred, merely a memory fact. To make it at all intimately a part of the student's mental life will require some very definite empirical knowledge.

Take a small table, and tilt it so that the plane of the top makes an angle of 30 or 40 degrees with the horizontal. Cover it with several thicknesses of cheese cloth, and allow a stream of water to flow upon it near the upper edge. Alternately stop and start the stream making the flow intermittent. Notice whether this affects the flow at the lower edge of the table. By means of a colored liquid notice how long it takes the flow to traverse the length of the table. Shut off the stream and see how long the liquid continues to drip from the lower edge. Now remove the cloth and with other conditions unchanged make the same observations and note the difference in results. The principal should now be intimately a part of the student's knowledge, but the application still lacks definiteness. A grassy terrace and a clay bank will be of great assistance at this point, and here the effects of erosion may be pointed out. Then it should be definitely pointed out that a mountain side first deforested, then swept by fire is in almost the identical condition of the clay-bank, while a forested slope is much better protected than a grassy terrace. Call attention to the fact that the temporary retention of water by the forest cover in a whole drainage basin will equalize stream flow as illustrated by the cloth on the table, and so prevent both floods and drouth. Then and not until then is the lesson complete.

Mention has been made of the work in forestry in the public schools of Philadelphia. Concerning that done in any of the schools except the Northeast Manual Training High School I know nothing and cannot, therefore, speak. But I can say that whatever has been accomplished in this school along this line has been due to the interest and enthusiasm of one man—Prof. John W. Moyer. He has formed a Forestry Club, the membership of which, because of numbers, he has had to restrict to members of the senior class. Instruction in tree and forest life is given, trips are made to the parks and near-by woods, and in this way a great deal of interest and enthusiasm has been created. The work is carried on entirely outside of school hours. I mention this work here because it contains a suggestion for anyone who is willing to give of his time and energy to this work. In schools where there is no regular course in forestry, the Forestry Club may be made in some measure at least, to take its place. Where such a course is in operation it gives an opportunity for the selection of a few choice spirits who are especially interested and enthusing them to the point where they shall become radiating centers of influence for this splendid work.

CHILD STUDY.

THE meeting of the Child Study department was held on Wednesday evening at 7 p. m. in the Engineering Building, Dr. W. W. Deatrick, professosr of psychology in the Keystone State Normal School, Kutztown, presiding. Dr. E. W. Runkle, professor of psychology, Pennsylvania State College, was secretary. The attendance was large.

The president, having called the meeting to order, introduced Dr. A. C. Rothermel, principal of the Keystone State Normal School, Kutztown, who addressed the section on

DULL CHILDREN.

In discussing this theme it is necessary to delimit the term "dull." For the present purpose, at least, the term dull is not to be taken as including what is generally understood as defective. Defective children are out of place in the public school. They should, properly, be in such institutions as that at Elwyn. By dull children, in this discussion, is meant such as do not show marked ability in school work.

Dulness is a relative term. Pupils regarded as dull by one teacher are often considered bright by another. This is so frequently, because such children are strong in some directions or lines of work and weak in others. In such cases there is danger that the pupils, especially if they fall into the hands of teachers in whose specialties they are not forward, are wrongly classed as being generally dull and so are unjustly as well as unsympathetically treated, and, losing interest, come to think themselves dull and drop out of school, or are practically forced out.

Too often schools, apparently following the principle that the pupil is for the school and not the school for the pupil, force out of school pupils who, because of partial or general dulness, are deemed unprofitable to the school. Stanford University has sent back to the farm a large number of students thus deemed "unprofitable." Other schools are doing the same thing.

Is this right? Some years ago in a New Jersey high school there was a boy who was extremely dull in mathematics. Mathematics was a fetish in that school and, because the boy was dull in mathematics, the school refused to graduate him. The lad left home, went to New York and sought work in which he was apt, for which he had a liking, a line of endeavor for which he was fitted, but the fitness for which his high school instructors had no skill to discover in him. And this boy, discarded by the school, finding himself and his place, is now earning $2,500 in a line of work which does not require mathematical ability but, instead of that, ability of quite a different sort—ability possessed by the boy who was driven from the school as dull. Such an instance forcibly suggests the comment that there should be some adaptation of the elective system to the curricula of our schools so that it might be possible for a student who is weak in certain studies but strong in others to reach the coveted goal of graduation. Surely it is a mistake to refuse graduation to a pupil simply because he may be weak or dull in some one line. If thus dull in a single branch his work in other branches should be encouraged, should be recognized, and should be rewarded.

The problem of the dull child is not infrequently the problem of the teacher. It is the teacher who is dull and not the pupil. Another teacher with greater insight would not consider the given child dull at all. The teacher is often the cause of apparent dulness in the child. Sarcasm on the part of a teacher will often serve so to repress a sensitive child that, practically, no response can be elicited. The sarcastic teacher is the cause of many failures in recitation.

The duty of the teacher to a child who for some reason or other has fallen behind his classmates is a question worth considering. How far can he "leave the ninety and nine and go after the lost" in imitation of the Great Teacher? In most cases, we fear, the estray is not looked after. And so, not infrequently, children who have real but unsuspected, undiscovered ability, are counted as dullards and are neglected.

Dulness is not altogether mental; it has a physiological aspect or basis. Much backwardness in study is due primarily to physical infirmity or defect. In 1900, as a result of a physical examination of pupils in New York schools, it was found that 28 per cent. suffered from some form of eye trouble and that 10 per cent. could not hear well. Most of these physically defective children were mentally dull, backward in their studies. Adenoid growths are also responsible for much apparent and real dulness of school children. Some superintendents—notably Supt. Laramy, of Phoenixville—have been waging persistent war on adenoids, and with some good results. Children suffering from indigestion, from lack of sufficient or probably nutritive food, from scrofulous taint, from other diseases, are dull because of these physical disorders. The disorder intelligently treated or removed, the dulness diminishes or disappears.

The school is responsible for much dulness because the curriculum is inflexible,

because the teacher has no freedom to vary from prescribed order, or because she has no knowledge of "nascent periods" and the "transitoriness of instincts." Much dulness, so-called, is due to the introduction of subjects and the employment of methods which are not adapted to the stage of growth or degree of development of individual pupils. There are certain best periods for the pursuit of certain lines of work, and that teacher is a blunderer who is ignorant of these periods and does not recognize opportunity or encourage budding talent even though this may involve unsettlement of a beautifully arranged school programme.

Again, much so-called dulness is merely distraction. Attractions outside the school prevent attention within its walls. We are living in a vaudeville age. Attention, concentration of purpose, power of sustained effort must be learned and gained; otherwise there must be dulness, and much of dulness complained of is no more nor less than lack of these desirable things.

Dulness in school may sometimes be traced to faulty conditions, an immoral atmosphere in the home. The efforts of the teacher are not seconded by the parent; the work of the school is neutralized by the indifference, the hostility, the immorality of the home.

Many cases of dulness cannot be classed. It is difficult to trace them to definite causes. But the teacher should seek to ascertain the causes and wherever it is possible to remove them, making every effort to do so. It is pitiable to consider what mistakes in judgment teachers have made. Oliver Goldsmith's teacher said that the boy was the dullest of all with whom he had ever dealt. Even mothers make mistakes and fail to recognize budding genius, mistaking it for dulness. Thus the mother of the great philosopher and historian, David Hume, declared that as a boy he was inordinately dull. Such blunders, such lack of vision, should teach us to be more careful, more observant and more sympathetic in our treatment of supposedly dull children.

Discussion of the subject treated in Doctor Rothermel's address was opened by Mr. J. D. Heilman, of the University of Pennsylvania. Following some general remarks on various points of the address, Mr. Heilman proceeded to give the results of some studies made recently by himself upon a number of pupils in the public schools. The general import of these studies seemed to be that the causation of mental dulness by physical defect is not so general as has been supposed. Owing to the arrival of the hour for the regular evening session of the Association, adjournment of the department had to be taken, Mr. Heilman leaving the floor, to the regret of his auditors, before completing what he had meant to say.

The second session of the Child Study Department was held at 11 o'clock Thursday morning. The president, Doctor Deatrick, read a telegram from Prof. G. Leslie Omwake, of Collegeville, stating that he had been unexpectedly detained and could not be present to read his promised paper on "Forward Children." Owing to the change of the hour of adjournment of the Association, Supt. Charles Lose, of Williamsport, who was to have spoken on "Nature Fakirs and the Child," found it necessary to take an early train for his home.

Some time was spent in the discussion of referred questions, among them one asked by a mother in the audience, who wanted to know why schools do not allow children to learn number combinations beyond a limit set for various grades. The bondage of many teachers to programme and an inflexible course of study, the Procrustean bed of uniformity, to which children of varying capacity are yet subjected, were roundly criticized in the discussion participated in by members of the department.

The section then proceeded to the election of officers for the year 1908-9. Dr. W. W. Deatrick was re-elected President and Miss May E. Hagenbach, of Bethlehem, Secretary, after which the section adjourned.

MANUAL TRAINING.

THE department of Manual Training met in the Engineering Building. Professor Edward Fitzgerald, of the North School, Pittsburgh, chairman, called the meeting to order at 11 a. m. Wednesday morning. He said that ten years ago but few people could be had to attend a meeting of this kind. Times have changed, and to-day manual training is one of the leading subjects of thought and experiment in the educational world. We have been rapidly forging ahead. The large attendance this morning at this meeting is evidence of the increased interest, and it is encouraging to those of us who were so long "in the minority." He then introduced Supt. Grant Norris, of Braddock, Pa., who spoke as follows of the

WAYS AND MEANS OF PROMOTING MANUAL TRAINING.

It would seem, from the subject assigned for this discussion, that the Executive Committee felt no arguments necessary at this meeting for the establishment of Man-

ual Training in our public schools; but that we are at a point where we want to know how to promote what has been almost universally established theoretically, while in very few places it has not been established practically. So I take for granted that you do not want arguments for the establishment of Manual Training in the public schools. Its benefits, its inspirations, its reformations, its augmentations and revelations in the public schools, where it has been established, have already been demonstrated to those of us who have been sufficiently interested to make investigations. But you do want to know how it may be promoted in all the schools of this Commonwealth and thereby become a greater force in the education of our youth.

The first requisite for its promotion, then, would be for the promoter to be thoroughly enthused with the subject and to know of its educational value in the development of the child. Do we as exponents of our public school system fully realize the value of an education outside of books? That the educator must make the external internal, and the internal external? That he must become familiar with modes of education which should give outlet? That theory, philosophy, abstractions, analyses, are but the fleshless bones of what the child ought to be—and without the well-rounded-out life which comes from contact with real things, how hideous the skeleton! Every child is a natural creator, imaged after the Great Creator Himself, and he wants to objectify his meager knowledge in something tangible, something material. In the forge of exertion the idea begins to glow and throw off its dimness and dross and stand out in the mind as clear as crystal, more perfectly perhaps than the eye will ever behold it in material form. The first requisite, then, is to really want Manual Training in your school, and to want it with all your might. When Governor Hughes wants a thing, he generally gets it; when Governor Folk wants a thing, it generally comes. When Fred Howe wanted a three-cent fare in Cleveland, it came; when President Roosevelt wants any thing, it happens. Why, "Nothing can resist a will which stakes even existence for its fulfillment." It is the man who is trying to do something because some one else is doing it who fails. It is the man who does not have a clear idea of what he wants to do that suffers defeat. The man without conviction, without purpose, without bravery, without initiative, will hardly need to know the "ways and means" of accomplishing that which has never stirred his own soul.

Granted, then, that we have a clear knowledge of the educational value of Manual Training, and have the pent-up enthusiasm ready to let loose in its establishment, what shall be our second step? Let the second step be to "spy out the land"; and in club meetings, town meetings, school board meetings, women's club meetings, and at every opportune time, talk the benefits of manual training in the public schools. Visit schools where it is already established, taking with you a committee from your own school board, and then come back and make, not a grasshopper report, but a report that will stir up local pride and local interest in the subject. This report should be published in the local papers, and copies freely delivered to all the patrons of the schools. After this is done, you are ready for a few general meetings, at which meetings prominent exponents of Manual Training should be present to address the audience. But in order to insure a crowd, there should be singing by the school, and a couple of short exercises in which the children are the performers. At a meeting of this kind it would be well to have some local man frame a resolution and present it to the meeting, recommending Manual Training to the School Board.

In many communities of this Commonwealth we have men of wealth, some of great wealth, who are reasoning with themselves what to do with their harvests, whether to build bigger barns and "eat, drink, and be merry," the remainder of their lives—investing in oil, coal, steel, banks, or what not—men who need to have their minds directed to investments "where moth and rust do not corrupt and thieves do not break through and steal"—business men who are willing to listen to a business proposition presented in a business-like way. I am glad to say that we have such men. Recently I heard one of them say that the investment he made in establishing Manual Training in a certain school was the best investment he ever made. If you have such men in your community, it might be well for you to begin figuring right away. Find out just what equipment you will need—benches, tools, everything, and then with this in hand, and in company with a committee from your board, visit your man. I have found out from experience that it does not profit much to call on a man for help with only generalizations to lay before him. The business man wants figures; he wants to know something about the benefits that will be derived; and then he wants to know how those benefits will be maintained. In Braddock, a borough of 54 schools, it cost $3,000 to equip the Manual Training and Domestic Science departments, and they could have been equipped for much less, but our benefactor

wanted us to get the best of what we purchased. At the end of one year he was so well pleased with what he had started that he established twelve forges, with engine and complete equipment, at a cost of a little over $2,000. You may have just such a man in your community.

In promoting Manual Training one should be careful not to overdo the matter in the beginning. The future maintenance should always be taken into consideration. Communities have over-burdened themselves in the beginning. It is better to start with little and grow than to be compelled to cut down, and at the same time listen to the groanings and mutterings of school boards and tax-payers on account of the expense. But after it is once introduced in the proper way, it will win its place alongside of other studies in the public school curriculum and will enrich itself year by year. Principals and superintendents of schools must necessarily champion its cause, and take the same interest in it that they do in the common and high school branches. The Manual Training and Domestic Science directors should not be left alone to further its cause any more than the grade or high school principal is left alone to solve their problems and further the interests of the schools. Those of us who supervise both high school and grade work have experienced what seems to be a gap, or breach, between the eighth grade and the high school. This should not be, and I have sometimes wondered whether it would be better to call the beginning class in the high school ninth grade, then tenth grade, eleventh grade, twelfth grade. So in establishing Manual Training, I would not establish it as a separate department but as an integral part of the public school curriculum, recognized on the report cards, and everywhere, the same as any other branch of study and work connected with the school system.

You probably ask, "What is the Department of Education at Harrisburg doing for Manual Training?" In reply, I would say that the Department is in most hearty sympathy with the movement, and is able to give valuable assistance and counsel to those desiring help. Our school laws do not make Manual Training compulsory, neither do they make high school work compulsory. These are matters for the local community to decide. But when each may be maintained out of the public school fund, it shows that not only is the Department back of the movement, but the Legislature of Pennsylvania as well. The Legislature has done all it can do to encourage Manual Training and Domestic Science in the public school of this Commonwealth at the present time. It is a matter for local communities to act upon. School boards are depending upon us for recommendations, backed up by strong motives and never-tiring enthusiasm.

I am not able to suggest ways and means of establishing Manual Training in rural schools where buildings are inadequate and conditions and needs are entirely different from what they are in boroughs and cities. But as fast as rural schools become centralized and accommodations can be provided, then the way will open up for some kind of industrial training. This cannot be brought to pass too soon for the sake of the rich red blood, brain and brawn of the country, hungering for that education which will help them to be better farmers, progressive leaders, and the preservers of our national life.

If we could only get the people to see how far short we are coming of giving every boy and girl in the land a complete elementary school training! Why, less than one-third of all the children who enter our schools ever finish the grammar school course. Five years is about the average training of our boys and girls; and many of our pupils start out to fight life's battles with almost no education at all; yes, about three-fourths of them. I believe that Manual Training and Trade Schools have a great field of usefulness in supplementing and in helping to complete our public school system. Are we doing all we can to help these boys and girls? Could not their natures be touched at more points and dormant aptitudes aroused if the Manual and Domestic Arts had a larger place in our school system?

The lecture was followed by a short discussion, in which Mr. Fitzgerald advised to interest people by having them come and see the school at work with sleeves rolled up and busy, rather than to see the result after the work is done. He told of his experience in Wheeling, where a public-spirited citizen wished to aid the work of introducing manual training into the schools; of the reluctance with which his offer of help was accepted, two years of effort being needed to get authority to try the experiment. Seven months after it was begun with a class of twenty boys, industrial training was firmly established as a feature of the city school system. The Board did this after the experiment was shown to be a success. The Women's Clubs have been doing much for the introduction of manual training. About two and a half hours per week—one hour to mechanical drawing and one and a half hours to shop work immediately thereafter—was thought time enough for this work in the ordinary school. The closing address was by Prof. J. P. Jackson, Dean of the School

of Engineering of State College. We had hoped to have this address from him, but have not received it up to the time of going to press.

The officers of the department were continued as last year: Prof. Edward C. Fitzgerald, Norris School, Pittsburg, Chairman, and Supt. Grant Norris, Braddock, Secretary.

"HEART OF THE ROCKIES."

SUMMER TRIP TO THE MOUNTAINS—YULE MARBLE THAT RIVALS CARRARA.

J. P. MCCASKEY.

HOME is a good place, but I was getting to be what some folks call "stale" and wanted something new. Besides I had been attracted by a very promising enterprise in course of development for the past three years in the Rocky Mountains, and, as some persons from Wilkes-Barre and vicinity interested in the same direction were about to make a Pullman trip to the "Heart of the Rockies," why not be of the party?

As we ran along the Susquehanna northward, on the Niagara Express, I thought of a moonlight trip on the deck of a packet boat in 1856, before the Northern Central Railroad was opened between Harrisburg and Williamsport. We had gone to the latter place from Pottsville, over the Catawissa road, for a meeting of the State Educational Association. After a good three days that had in them more of boating and saw-mills and the pleasant companionship of a summer holiday than of sober school questions, the short way home was by the packet for an all-night ride of nearly ninety miles to a point above Harrisburg where the morning boat met the train. Old friends, where are ye now! It was a jolly party fifty-two years ago.

A delay of an hour at Sunbury and we take the North Branch road for sixty miles to Wilkes-Barre, meeting Messrs. Welton and Burdick, of the Colorado-Yule Marble Company, at the Sterling hotel. After sunset the walk on the wide green area along the river, with its noble elms, was a hint of Paradise. I had a rare evening at the home of Rev. Horace Edwin Hayden, and saw him again next morning at the rooms of the Wyoming Historical and Geological Society, of which he has for many years been custodian and librarian. This valuable collection and library have been gathered largely under his own hand and eye. He went with me to the beautiful St. Stephen's Episcopal Church near by, whose doors are never locked during the day, which I had seen before and wanted to see again. The sane man of unselfish enthusiasm in good works is the man that counts—and he is Rev. Mr. Hayden. A pleasant call also at Mercy Hospital upon the Mother Superior and two of her assistants, noble women of consecrated lives. During the morning we visited the well-known Dorrance Rose Farm, near Wilkes-Barre, where more roses are grown yearly than at any other place in the Atlantic States. Mr. Dorrance holds marble stock and was going with us, but had to defer the trip until later in the season.

At noon we left for Scranton over the Laurel line, their high-grade electric road, which is made and ballasted like the ordinary steam road. Late in the afternoon we ran through a charming valley in Steuben County, New York, which I saw last, in the summer of 1860, on my wedding day in the pleasant little town of Bath. There is a noble elm at the station that was not so large a half-century ago. The spire of the church rises yet among the trees—pointing the upward way. Some things are of priceless value. They do not come within the arithmetic of earth or the Arabic notation. What destiny may hang upon marriage! The highest privilege of time is that of worthy parenthood. The greatest wealth of time, perhaps of eternity, is worthy children and "children's children" through many generations. The one reason that I see for the creation of this wonderful world of ours is that worthy souls may come into being upon it, with the boundless prospect and promise of eternal life. Quoting my old friend Dr. Higbee: "I should be filled with gratitude—and I am." So it was with unusual interest that I saw again the town of Bath.

We reached Buffalo by evening, Chicago next morning. Took a cab to see something of the city between trains, passed the large building where the Republican Convention nominated Wm. H. Taft for President the day before, and where on that day Mr. Sherman was nominated for Vice President. Through Illinois, Iowa, Nebraska, Kansas, Colorado, a run of 1,072 miles, and we are at Colorado Springs and "The Antlers" hotel.

In our party is Mr. William N. Jennings, now in his eightieth year, a lumber dealer of Wilkes-Barre, quoted as a millionaire, who crossed the plains to California in 1850. Kansas and other states through which we passed were then a part of the Indian Territory. There was not a farm in all the region that is now little else than farms, whose annual products are of fabulous value. This keen-eyed business man

of fourscore is alert and active as an average man of fifty, rides a bicycle and runs an automobile. He too has put money into the marble proposition, and is going out to have a look at things. He is blessed with a retentive memory and had the good habit when a boy of picking up things he liked in the old English Reader and elsewhere, a habit that he has kept up, mainly in the line of humorous verse written by himself and others. He was ready on call for favorite selections and we had many a laugh at hearing them. At dinner in Marble City he gave us a good thing on "cooks and dining," crediting it to Mark Twain. Colonel Meek, who had been laughing heartily at the recitation of the lines, said, "It's from Lucille. Owen Meredith wrote it."

To return to "The Antlers." Our train is to leave for Pueblo at 10.30 a. m. After an early breakfast we take an auto ride to the foot of Pike's Peak, but do not have time enough to go to the summit. Instead, we "do" the Garden of the Gods on this glorious morning, making a run of forty or fifty miles in ample time for our train. Here the water ages ago played tricks with the rocks, and left fantastic forms that suggest the names they bear. It is a memorable ride, and Mr. Spencer Welton, who travels in easy slouch hat and woolen shirt, enjoys everything and has his quiet eyes everywhere, insists that it shall be his "treat" to the party. There is protest, but he has his way.

Some distance south of Pueblo we are halted for two hours in the hot afternoon because of an accident to a freight train. They build a track around it, and on we go pushing along the valley of the sluggish river towards the Royal Gorge of the Arkansas. I have read of such mighty walls as these, but have never seen them, and did not know what I have been missing with quiet content. If I live awhile longer I hope to see more of them. Mr. Welton tells me of a friend who has gone to Europe every summer for nearly fifteen years—but has never seen the wonders of the Rocky Mountain region and the coast ranges.

By evening, still running along the headwaters of the Arkansas, we reach the summit of the Rockies, twelve thousand feet above the sea. The altitude of Denver is one mile above sea level—this is more than two miles. Venus hangs clear and bright above the sky line of a grand mountain peak. These mighty mountains! And the splendor of the old familiar stars in this pure air and cloudless sky! I sit in the rear of the observation car for hours of the night—the wide universe, Milky Way and all that can be seen of the rest of it, in full view from this mountain height of vision. The most magnificent sight the eye of man ever looks upon is the clear sky of a winter night—or such a sky of stars as this. "By the splendor of God!" was the mighty oath of sheik Ilderim, who owned the Arabian horses, star-named, that were driven by Ben-Hur in the chariot race. It must have been inspired by such a sky as this bending over the desert, or perchance above the vale of Shinar.

Towards midnight we plunge into another canyon greater than the last. For many miles it seems as if we are running down a great street of a great city—all asleep or dead in the darkness—whose heavy walls on either side tower above to where a section of the star-lit heaven alone is visible. The effect of this illusion makes the canyon more impressive by night than seems possible in the light of day.

Leaving the train at Glenwood Springs, which is reached soon after we pass out of the canyon, we find a good hotel, and in the early morning are on the way to Carbondale to meet the special car that Colonel Meek has sent up for us. The lands here are irrigated, as in some parts of the country we saw yesterday. Near Carbondale is Mount Sopris, nearly three miles in height, said to be higher than Pike's Peak. It looks in this clear atmosphere to be but a short way off—perhaps a mile to its base and two or three to its summit—but the distance is seven or eight miles to its foot and ten or twelve to the snow.

The day is warm and bright, and the ride from here to Marble City full of interest. A short distance below we are joined by another party, among them Hon. Josiah Quincy, late mayor of Boston, on the same quest with ourselves, and as much pleased with what he saw.

We reach our destination about noon. It is marble we have come to see and here it is—marble—marble—marble—the first thing that meets the eye as we leave the car. An immense pile of it, in blocks that weigh six, eight, ten tons each, white as milk, which have been brought down from the quarry by the big California traction engine, making its two trips per day and hauling fifty to sixty tons each trip. There are twelve cubic feet to the ton, rated in the rough at four dollars per foot, so that each load is worth from $2,500 to $3,000. The wheels of this engine are nine feet in diameter, and the tires twenty-six inches wide—making it and the broad-tired wheels of the trucks it hauls an effective road-roller. The man that runs it came with it from California. It's familiar name "The Best" looks like home, and makes me think

of the trade name given to his widely-known boilers and other manufactures by our late genial townsman, John Best—that were "Best" in a double sense.

Here is the Crystal River, a clear-flowing stream with rapid current, about the size of the Pequea Creek at home. It flows from the small lake into which the waters of the Yule Creek and two or three more of these mountain streams fed by the melting snow find their way. Here are the mills, and the railroad and the heavy derricks that lift and carry and place these great blocks as a man would handle a brick, and the level, open area all about on the immediate front—but where is the town? Only the native forest growth that covers the sloping hillside, with new frame houses scattered among the trees. Good roads have been cut through here and there as needed, but of regular streets there are none. It is as yet a town upon paper, practically but three years old—having grown from a half-dozen people then to five or six hundred now—with the sure prospect of becoming the most unique and one of the best known towns of Colorado, should Colonel Meek live to direct operations here for the next twenty years. It was said of the Emperor Augustus that he "found Rome brick and left it marble." It may be said of this man that he "found no town at all and left it marble." The name Marble City will, I think, prove no misnomer; for here marble "waste" seems the best building stone within reach. The plans have already been drawn for a hotel of white marble to accommodate visitors who will throng, in the years to come, to this attractive place in the very heart of the Rocky Mountains. Its population, now a few hundred, must within a decade be increased to thousands, dwelling in a beautiful city, in the perfect air and sunlight and amid all the health conditions of these mountains—with an industry of world-wide interest and importance behind the place whose life will be the life of centuries, if one may judge from the immense deposits of high-grade marble that show so plainly here. Does the visitor have doubts—as well he might, for it seems much "too good to be true"—let him take measuring line and pencil, note the result of borings, and cutting, and polishing, and comparison with other finest marbles of the world, and cipher for himself as to time and the value of the product.

We have a hearty greeting from Colonel Meek on our arrival and are driven at once through the woods up to his headquarters, a comfortable home in commanding position on the hillside. As we reach this high point of advantage there breaks suddenly upon us the tremendous sweep of the mountains near and far, dark green with forest, or brown and bare, or white with snow. For majestic mountain scenery this outlook is not easily surpassed. The grand "uplift of the hills" is in it everywhere. It is an ideal site for a great mountain hotel, the yearly summer resort of thousands seeking recreation and health of mind, body and spirit. As you look down from these porches upon the tops of the trees that cover the slope in all directions, Kline Falls on Yule Creek and the mountain road to the quarries are in full view across the narrow valley.

After dinner we are taken in carriages to the marble quarries on the mountain side, 9,300 feet above sea level, which must always be in the open sunlight. On the way there are three miles and more of this broad and level road—one of the half-dozen great things done here during the past three years by Colonel Meek—that winds and climbs along the face of the mountain until we have risen far above the little town, and everything below lies as on a map before us. Three years ago the bear, antelope and other wild game were here in their native haunts. The beaver is still in the waters below and makes trouble at times. Last year Colonel M. got authority from the state department to kill twenty-five of them.

Leaving the carriages as we near the quarries, we climb for some distance, take the movable incline, then the ladders, and are amid the din of the channeling machines, high up on the mountain side. Here several cuts of marble have already been made, each several feet in depth, broadening the floor, and increasing the working area, so that room is had for more machines. There are seven or eight of these powerful channelers now at work, and as fast as room is afforded more are added. It is estimated that the next level cut, upon which they will soon be working, will afford one hundred thousand cubic feet of marble, worth, in the rough block, at lowest rate, four dollars per foot. The hard and rapid stroke of these long channeling tools working under heavy air pressure—the air being compressed by electric power—sinks holes rapidly into the white rock wherever they are wanted and to any depth required. These holes are on the side and base of the block to be detached, and near together. The hard rock between them is broken by driving steel rods into the holes between long, thin strips of metal, so as to bring the breaking pressure to bear evenly and in the right direction. In this way blocks of any desired size and shape can be detached from the general mass, up to the limit of

six hundred cubic feet, which is the largest size that can be handled by the fifty-ton electric derrick recently installed. This means a block ten feet wide, three feet high, and twenty feet long; or one from which to cut a solid column four feet in diameter and nearly forty feet in height; or, of course, a solid block of marble of any other shape or size the product of whose dimensions is six hundred cubic fect. Think of moving this hundred thousand pounds of marble at one "lift" of the mighty derrick!

I asked the boss quarryman, a giant from the Vermont quarries, what he thought of the quality of the stone. "Never saw marble better than this," he said, "and I have been working with it all my life." "How long before all this will be worked out?" He laughed as he replied, "Methuseleh would be in the kindergarten of that job!" And so, indeed, it seems to promise.

Forty per cent. of this vast bed is believed to be fine statuary marble. Carrara, not far from Florence, in Italy, has supplied the world with statuary marble for more than two thousand years. Carrara marble was used to adorn the city of Rome in the time of the emperors. Hundreds of quarries have been opened during this long period, many of which are no longer worked. They give employment even now to more than six thousand men, four thousand of whom are in the hundred and more cutting and polishing shops. But the machinery and modern equipment of this Yule quarry and mill makes one man here worth a dozen at Carrara, and their finished product shows this American marble the only rival to the best Italian.

Beds of marble of moderate depth in many places alternate with other kinds of stone, but here the mass of marble is deep and of wide extent. Much of it is pure white, the rest slightly veined, often beautifully mottled, but all of it classed as "white." And fine white marble is standard. Other marbles are in favor for variety and for a time, but white is and has always been the favorite stone with the great builders. Its place is assured. It will never go out of fashion. As wheat is staple among breadstuffs, so is marble among building stones. In art it stands next to the precious stones; and when it comes, a finished work from the great sculptor, it is in truth, a "precious stone" in itself. This immense deposit, which will not be exhausted in centuries, is like a vast bin of flint wheat that never moulders or decays, but remains sound and solid and good until the last bushel is measured up for mill or market. What year by year the market demands may be drawn from the bin and shipped at standard market price and of unfailing quality. No need to throw a staple article like this upon a full market.

So we see here at the quarries the machines that can cut from the solid rock blocks of any size and shape desired up to the limit of 600 cubic feet, and the derrick that can swing it to the traction engine. The engine delivers it to the mill at the foot of the mountain, where the saws and polishers with all their labor-saving devices and up-to-date equipment, work it rapidly into whatever forms and sizes may be ordered from the draughting rooms, each piece being worked to plan and a careful account kept of the time and labor upon it. The standard gauge track of the railroad runs by the side of the great mill, which is seven hundred feet in length and sixty-five feet wide; the finished product is transferred promptly from the mill to the cars and may be sent anywhere in the world within reach of railroad or navigation lines.

It is a far cry from Athens to Marble City, but Marble City can supply precisely what Athens wanted and obtained in the Parthenon—"the most beautiful and artistically perfect structure of its kind of any age." So it is a far call from Phidias—by whom it was planned and built in ardent love of country and profound reverence for the gods—and Pericles and thousands of the gifted sculptors of the Greek period to Michael Angelo and Canova and Thorwaldsen, our own Hiram Powers, and the less number of artists of the later time. But they all knew that "temple and statue the marble block hides," they felt and knew that

> "Every block contains a Venus
> With but uncut stone between us."

And these men could cut away "the stone," like the fabled Pygmalion, to release the fair Galatea. Members of the same wonder craft, they would gladly recognize one another.

Bring these men together in Pullman excursion trains to Marble City. Take them over the same route as that of our smaller and less gifted party. Let Colonel Meek, "as guide, philosopher and friend," be their host, take them up the mountain road to the quarries where they might see the busy channelers at work, and the derricks, to the limit of fifty tons, swing with ease their heavy weight; show them the huge blocks of flawless stone ready for the mill, the polished cores of the borings to the depth of nearly three hundred feet, and the vast extent of the deposit; let them note the readiness and certainty with which the traction engine delivers its load of sixty tons at

the foot of the mountain; show them through the great mill with all its modern machinery run by electric power—duplicating men by the score, at times by the hundred—thirty gangs of saws supplemented by the necessary grinding and polishing machines and by the great circular diamond saw, more than four feet in diameter, that cuts through a marble block eight inches in thickness at the rate of several inches per minute; show them the iron road close at hand on which the finished product of the mill may be carried with ease and despatch wherever ordered, though the place be thousands of miles distant; take them to the power houses where, under the tremendous pressure of 192 pounds to the square inch, the force of falling water is converted into electric power, the "white coal" that keeps everything going here to the limit of its capacity at little cost except for the "plant" required; follow the steel pipe line, a straight black cylinder in full view upon the mountain side, widening in diameter from twenty-eight to thirty-six inches, to where an elevation is reached three hundred and fifty feet or more above the power plant, at which point it dips into the Yule Creek, a mountain torrent fed from the melting snows all summer long, and have them see the great work done here to utilize the dynamic force of the rushing current; note their comments on the way, anywhere and everywhere, and when they have been over all the ground and seen all that can be shown them in a day, call a symposium until midnight; make stenographic report of what these men say of Yule marble and this Yule marble plant and these modern ways of working the stone; put it all into a book or series of books and publish it to the world. What temples they would see here! what cathedrals! what palaces! what groups of classic art! what forms of strength and beauty, of dignity and power, both of gods and men! The copyright upon a book like this would be a valuable item among the assets of any business man. And these men—sculptors, architects, artists—would but hear what we have heard and see what we have seen.

This marble deposit was discovered in 1888, just twenty years ago, by Professor Newberry, geologist of Columbia University, New York. He reported it of great extent and of quality equal to the Pentelic marble of which the Parthenon and other famous structures of Athens were built. Later Mr. A. J. Mitchell, an engineer of Denver, had his attention drawn to the marble, and, recognizing its immense value, he devoted two years to buying out mining claims and acquiring title. Dr. Kline, of Philadelphia, was associated with him in the venture. Mr. Mitchell built for himself a comfortable house in an eligible location, and sat down, almost alone among the wilds, to keep an eye upon his Treasure Mountain. Dr. Kline died. His memory is perpetuated in Kline Falls. Litigation followed, no railroad as yet came near the place, capital could not be attracted, no company could be organized, and still Mitchell held on stubbornly for ten years longer. Then he met the King—Carlyle says, the king is simply "the man who can"—in Colonel Channing F. Meek, who heard his tale of wonder, and, looking into it carefully, found it so true that he now thinks "the half was never told him." Colonel Meek was just the man to plan an enterprise of such magnitude as this upon very broad and comprehensive lines; to develop harmoniously its leading features; and to direct in detail, minutely if need be, whatever might require attention—a man of ample means, full of generosity, courage, initiative, resources, and trained by large responsibilities to carry weight easily. Had he not already done great things as General Manager of the Union Pacific Railroad? in re-organizing the street railway system of the City of Mexico? and in putting upon a solid basis the Shredded Wheat industry? He was a man who could afford to decline Jay Gould's offer of twenty-five thousand dollars a year to be one of his vice presidents. Mr. Gould knew the men who could do things, and bid for them. He is a railroad builder and one of the first things he did here was to put the prospective Marble City in close touch with the world by building seven or eight miles of standard gauge railroad. He has now in hand—because the time has come for it—the construction of a trolley line of three miles up the mountain road, upon which a powerful rotary sweeper can be run, to keep the tracks clear of snow for the cars hauling marble during the winter. Colonel Meek is not only an ideal executive, organizer and manager of so great an enterprise as this, but he is at the same time a gentleman of culture on the best lines, a lover of art, literature and music. During the evening of our stay he gave us, upon the Angelus attachment to his piano, "The Poet and Peasant," waltzes by Chopin, and other selections from the best composers.

Resolved upon organizing a company with capital stock sufficient to assure success, he tried to interest capitalists. But capital wanted the lion's share or was shy. He then met Charles Austin Bates—who shares equally with himself the merit and the honor of making this great enterprise a substantial and brilliant success. Mr. Bates went over the ground with Colonel Meek, saw at once the untold possibilities

of the situation, and became no less confident and enthusiastic than the Colonel himself in pushing the work. He has driven the financial side of it with such intelligence and vigor that a thousand stockholders are now interested, a fact upon which, we think, the said stockholders have reason to be congratulated. These two men of ability and integrity have led all the rest in the strain and stress of the past three years. They have been the essential men. With October 1st the quarry and mill go upon a commercial basis, and within a year it is thought the stock should begin to pay a fair dividend.

The men in charge of different departments of the work at Marble City are experts in their various lines. Senator J. F. Manning, late Mayor of Rutland and State Senator of Vermont, is lieutenant-general here, and in the absence of Colonel Meek directs all operations. He has been a prominent man in the marble business of the country for twenty-five years, first at Washington and afterwards at Rutland. He has visited all operating quarries of any importance in Europe and America, and is widely and favorably known to architects, builders, and men dealing in marble. Within the past year he has secured contracts aggregating a million dollars or more in Cleveland, Youngstown, Denver, Salt Lake City and elsewhere.

Mr. Chas. A. Bates is glad to have visitors to Marble City wire him their impressions of the place after they have seen it and the work doing there. My despatch to him before taking the train for home was this: "I have long been looking for something that will work for centuries in aid of two or three good causes that I want to help when I am gone. Here it is. I have put thirty thousand into it, and am abundantly satisfied that there is no sham in this great enterprise. For generations America will be made architecturally and materially more beautiful from this immense body of fine white marble. Its opening and development by Col. Channing F. Meek will mark an era in the history of our architecture. Like these mountains everything here seems on a colossal scale."

It is asked, "Why was Colorado so slow to learn of these beds of marble and to recognize their value?" Both the United States Geological Survey and that of the State of Colorado had located them on the map. But they were deep in the heart of the mountains, not easily reached, and so far from railroad communication as to be practically out of reach. When the State Capitol was to be built it was provided in the act that it should be of Colorado marble. The contractor did the best he could. He found the stone, got out some of it (with dynamite, it is said) and somehow got it to Denver. But it was quite impracticable to quarry and transport blocks of such size as would be needed. The report of a commission appointed to act in the matter substituted something else, to the disparagement of Colorado marble, and giving it such a "black eye" that it has until recently been a disreputable stone. Within the past year, however, Denver has been gracefully admitting her mistake, and the Cheesman Memorial Building, to be constructed wholly of Yule marble, will soon stand upon the highest ground in old Congress (now Cheesman) Park, which, I was told when at the park, is the highest ground in this beautiful city. The mills at Marble City are now busy upon this Denver contract. It looks again as if "the stone that the builders rejected is to become the headstone of the corner."

The City of Denver has just been waking up to the immense value of the Yule marble beds. A special committee of the Board of Trade, after a careful examination of the field and the work thus far done in it, presents these amazing facts and figures to their business friends and associates on their return. I quote from their report, as found in the Denver *Post:*

"We visited the town of Marble and spent the greater part of two days inspecting the quarry, the electric power plant and the marble mill, together representing, by September 1st next, a cash investment of $1,500,000. All this capital is from outside of the State. The company has two marble deposits, viz.: One on White House mountain on the east side of Yule Creek, not visited by your committee, and one on the mountain on the west side of Yule Creek; visited by your committee and the subject of this report. This latter deposit is practically unlimited in quantity, being about a mile long, 240 feet thick, as exposed on the face of the cliff, and dips at a moderate angle into the mountain for an indefinite distance, as yet unascertained. Marble experts of wide experience say that it is by far the largest white marble deposit known in the world.

"For the purposes of rough estimate and to get at some general idea of the commercial importance of this one deposit alone, take the dimensions as 5,000 feet long, 250 feet thick and only 200 feet wide, although, in all probability very much wider. That means 240,000,000 cubic feet of marble. In order to be conservative, however, we will divide that figure by four, which gives 60,000,000 cubic feet, or, at twelve cubic feet per ton, 5,000,000 tons of white marble. The market value of

finished white marble depends on the article into which it is made and the time and labor involved. Taking $4 per cubic foot as a moderate average for the rough product, the above minimum quantity of 60,000,000 cubic feet represents $240,000,000, or 5,000,000 tons at $48 per ton. There is no metalliferous mine in Colorado or anywhere in the world that can quarry $48 ore, with millions of tons of such ore exposed. All present indications are that this deposit of white marble can be continuously quarried for more than a century to come without exhausting it."

Marble buildings of good architectural design speak as do no others. As our eye has caught the stately proportions of the dome-capped banking house of white marble, with its massive pillars, recently erected by the Girard Trust Company of Philadelphia on the northwest corner of Broad and Chestnut Streets, we have stopped again and again to admire and enjoy. Of this noble structure, a kind of civic monument by which the city is permanently enriched, the *Public Ledger* speaks as follows:

"It is its monumental character that distinguishes the new Girard Trust building among recent civic architecture. There is no more valuable plot of ground in Philadelphia than that on which it stands, nor one capable of yielding a higher rental if utilized for a sky-scraping office building. This greed for rents has been the destruction of our modern American cities. The Girard Trust Company has had the patriotism to resist it. It is not in the business of renting offices. Its business is banking, and it has put up a building suited to its needs that is not expected to yield any additional income. And this it has done with such noble dignity and splendor that all the towering structures around it are made to look cheap and flimsy by the contrast, and the owners gain more than compensation for the sacrifice in rents in the honor of having given to the city a work of art that will be always a source of public pride and delight.

"It is a pleasure to dwell upon this example of true public service in a utilitarian age when private landowners as well as wealthy corporations too seldom recognize any esthetic obligation to the community. There is something akin to it in the new railway station at Washington, a truly monumental structure worthy of comparison with the most splendid of the governmental buildings. It is only a railway station, but in its dignity and beauty it must have an uplifting influence upon every one who hurries through its portals. We are learning, in this country, that art and beauty are not mere luxuries that have no usefulness; that they enter into the concerns of daily life, giving dignity and charm to the most prosaic purposes, and that whether we have to do with a railway station or a bridge, a bank, a shop or a factory, even a street lamp or a sign-board, it is worth while to make it beautiful. Not only is it worth while; it is a public duty and service."

A few weeks ago when in Washington at the dedication of the New Municipal Building, on reaching the city I ran into this new railway station, and wandered about through it with a feeling of delightful surprise. All three of these buildings, the Girard Trust, New Municipal, and Railway Station, are of white marble, neither Pentelican, Carrara nor Yule, but good American stone. "Yule" is coming to the front, and will soon speak for itself in great buildings in the National Capital and other leading cities, and the nation will come to reckon it a valuable asset just as Italy does "Carrara."

It is a hundred years and more since the marble quarries of New England were opened. Two hundred millions in value have already been taken from them, and they are not yet exhausted. The United States is now using about thirty millions of dollars worth each year, and statistics seem to show that the demand for marble has doubled every ten years during the past century. As wealth increases the demand for the best, with little regard to its cost, will also increase. So that the future of the marble industry seems doubly assured.

YULE! I like the good old Saxon word. It came out of the forests of Germany, crossed the North Sea with the Angles and Saxons who gave name to England, and calls up "the fine old English gentleman all of the olden time" who kept the royal feast of Christmas with generous hospitality. The Saxon feast of Yule was at the winter solstice, or shortest day. With the introduction of Christianity among them the Eve of Yule became Christmas Eve. The Yule log was, in some places, thought to keep away pestilence all the year from those who sat round it on the festal night. The great Yule candle, that was burned only on Christmas eve, was put out before it was burnt out, and part of the candle and part of the log were kept with care, through all the year, until the next Yuletide.

Many guests, and viands dainty,
Fill the hall and grace the board,
Yule, Yule, Yule, Yule,
Crack the nuts on Christmas eve,
And cry, "YULE!"

The stream has come leaping and foaming down its rocky bed nameless for thou-

sands of years. Did some one name it thus happily on Christmas day? In it all the while was the power of two or three regiments of wild horses. It has been harnessed by Colonel Meek and put to work, made to pull heavy or light exactly according to orders, and charges nothing for service beyond the cost of the harness. Wherever the English language is spoken "Yule" is a favorite word, and no other name so good can be given to the product of these quarries as "Yule Marble."

TRAINING FARMERS.

WHAT can the high schools do in this respect? It will help us to answer this question if we can first agree upon the elements that are especially needed in the education of a well equipped farmer, in addition, of course, to the general education that is necessary for all. Let us consider what these elements are.

First, the intelligent, up-to-date farmer should know the general principles of physics and chemistry. Of these two subjects, chemistry is of rather the greater value to him, and some special laboratory work in chemistry would be well, but would be of little use in physics.

Second, he should have a course in botany. This course should not deal exclusively with wild flowers, but chiefly with industrial plants of the farm and garden, and not only their forms and structure, but their chemical composition, the kind of soil and of food that they need, etc. He should also know a great deal about birds, wild animals and insects, both helpful and injurious, to vegetation, and means of protection, so far as known, against the latter. Indeed, a knowledge of insect life is of the utmost importance to the farmers. Few of them realize this.

Third, he should have as thorough a knowledge as possible of domestic animals and fowls—how to feed and care for them; diseases to which they are subject; the preventives and the remedies, etc. It will be seen that here is a large field where great intelligence is needed.

Fourth, the farmer should know something of geology and astronomy; the latter, if for no other reason than to enable him to read intelligently the almanac that hangs by every farmer's chimney.

Lastly the farmer needs training in some simple form of bookkeeping adapted to his business. It may seem a strong statement, but I believe it to be true that more farmers are unsuccessful because they do not know how to keep their accounts properly than because they do not know about soils, seeds and fertilizers; or for any other one cause except shiftlessness, which, I think, would in a measure itself be cured by a training in bookkeeping.

These things I have named seem to me the essentials of a farmer's education, and therefore indicate the subjects that should be taught. I have also named them in the order in which I believe they should be taught, except the bookkeeping which should come in the first or second year, with a final course in the last year.

I believe the instruction in botany, and also that pertaining to the care of domestic animals, should be associated with practical work carried on by each pupil at his home.

During the last year or earlier when the foundation has been laid for them, certain specific processes of value in farming might, be treated, such as making butter and cheese, testing different kinds of feeds, testing milk by some of the mechanical processes in use, setting buds and grafts, etc. But so far as these things are undertaken, they should be handled with business-like dexterity and expedition, for the sake of the effect on the character of the pupils. For example, in one instance, more than four weeks or about fourteen lessons, according to the statement of the principal, were spent in teaching the pupils to set grafts. As I was told this I could not help recalling the morning, in the early spring of my fourteenth year, when I went into the orchard with an older brother and in less than twenty minutes learned the usual ways of grafting, and of over a thousand grafts that I set that year I lost only five or six. In another fifteen minutes one day I learned to bud certain kinds of trees. It is not, as it may seem, boastful to mention this, because almost any boy of my acquaintance could have done the same. With a course in botany such as I have suggested as a preparation, one lesson at the most should have sufficed to show the process, and then the pupils might have been asked to set somewhere fifty or sixty grafts each and report results.

The mechanical manipulation of a Babcock tester ought to be mastered by a person of average ability in two hours, and by one prepared for it by some knowledge of physics and chemistry in half that time. To spend five or six weeks on it in a high school, without even then touching the physical and chemical principles on which the instrument works, is to teach pupils not to work but to dawdle, and the bad habits and the false notions of effort and duty they will acquire, will more than offset anything of value in the instruction. It would be putting the stamp of school approval on

an already too prevalent notion—that one is justified in taking work very leisurely when the expense is met by the public. Another bad result is that feeble effort here soon extends to the other work of the school, and dilettanteism everywhere prevails.

There is enough to be done without frittering time away. To suggest one thing, it seems to me that after a knowledge of chemistry has been acquired, instruction in the process of making denatured alcohol out of cornstalks, unmarketable potatoes and other suitable products of the farm might be given. I doubt very much whether any one New England farm has enough "waste products" suitable for this purpose to make the setting up of the necessary apparatus profitable, but possibly all the farms of a district might. We are told that the farmers in some parts of Europe add materially in this way to the income from their farms.

If what I have said is sound, it follows that if a course in agriculture is to be introduced into any of our high schools which is to be of any practical value, it must have a substantial basis of preparatory knowledge to rest on, and must demand hard, earnest study on the part of the pupils, with much individual experimental work at their homes. Learning desultory mechanical processes that could be learned in less time at home, will not satisfy the need. These may be valuable, and they may be interesting, but they do not constitute a well-rounded and complete training for a farmer.—*Massachusetts Report for 1906–7.*

OPTIMISM AND PESSIMISM.

REV. CHARLES M. SHELDON.

AT the threshold of Life, as I started on my journey, I met two travellers. One had the face of an Angel, strong hopeful, courageous loving. The other was gloomy, forbidding and stern. The scowl on his brow and the sneer on his lips spoke of defeat and bitterness and contempt of God and man.

I took my first step on the journey and the two travellers at once joined me, one on each side.

"I am Optimism," said one. "Walk with me and I will cheer thee with good company, if I do say it."

"Better go with me," said the other. "I am Pessimism. I rail at all things, but I see the facts of life. No superficial or false estimate of history blinds me to what life truly is. If thou wilt get the most out of it, come with me."

"The greatest fact of all," said Optimism, "is God. If thou wilt walk with me thou shalt have God with thee every step. For I am born of Him and I can tell thee where He may be found every moment."

"That is all very well," sneered Pessimism. "But if thou goest with him thou must bother thyself with thoughts of conscience, and duty, and obligation, and responsibility, and many other obsolete and worn-out theories long ago discarded by an enlightened age of progress. Come with me. All thou hast to do is to eat, drink, and be merry, for to-morrow we die."

"And after death the judgment," said Optimism. "But a judgment thou needst not fear if thou will come with me. For fear is taken away out of the souls of all those who journey over the way in my company."

"Hear him!" quoth Pessimism, laughing harshly. "What childish folly to shut the eyes to all the misery of a world of pain and defeat and loss! The only things worth living for are the things of the senses. It does not pay to deny ourselves, to carry burdens, to help others, to practice what is called love. Give me the facts in the case. Come with me and live according to the facts."

"The greatest fact in the universe," said Optimism, smiling, "is the fact of Jesus Christ. Not even Pessimism has ever been able to wipe Him off the pages of history. Come with me and I will introduce thee to Him, and to Eternal Life."

At that Pessimism flew into a rage, and in language that ranted and raved he cursed all holy and reverent things. And as I hesitated, strangely enough, for Pessimism seemed to speak with a hypnotic attraction that had centuries of power behind it, I saw Optimism smile again and he suddenly and lovingly drew his hand over my eyes and there fell from them, as it were, scales, so that I saw by the side of Pessimism crowding close up to his presence certain fearful shapes that made me shrink back closer to Optimism; for around Pessimism surged Defeat, and Despair, and Stoicism, and Cruelty, and Indifference, and Unrest, and Cynicism, and Criticism, and Faultfinding, and Infidelity, and Moroseness, and Bitterness, and lastly, a grim figure with a fearful grin of triumph that I recognized as Death. And these figures brandished certain symbols. One carried a gaoler's bunch of keys and the manacles of a prisoner. Another held up the germs of all diseases in a phial. Another threw a searchlight on piles of wrecked and ruined homes. Another waved aloft a

book of memories of evil deeds and still another the record of past malignant thoughts. The sight was so terrible I crowded closer to Optimism and put my trembling hand into his, upon which my fear departed, and I saw around him beautiful companions: Divine Enthusiasm; Hope, with the wreath of unfaded garlands on her brow; To-morrow, lifting a light above her head and pointing at the Day after herself; Sweet Forgiveness of Sin, with her foot on the grave of the Past; Friendship, and Home, and Children; and best of all, the radiant, love-crowned figure of Eternal Life.

So I trustingly put my hand into the hand of Optimism and started forward, and as I did so, Pessimism and his black retinue sank out of my view forever and departed into their own place. "Thanks be unto God, who giveth us the victory through Jesus Christ our Lord!"—*Gospel Herald.*

MILLIONS IN GIFTS.

LAST year John D. Rockefeller gave away a total of $44,419,500. Since January 1 he has added to this $2,191,000 for the University of Chicago, bringing his entire contributions to that institution up to the astonishing sum of $23,809,661.98. Mrs. Sage, second on the list, turned $13,489,700 over to various worthy causes. The aggregate of Carnegie donations was $13,148,775. Only a small portion, as recorded, went from each for charity, the expenditures being in behalf of some phase of educational advancement. That large amounts in addition may have been devoted to alms, the incidents not being heralded, is an easy supposition. The grand total, as reckoned by statisticians, including the contributions of the munificent trio mentioned, and a long list of others, was $148,902,130, probably somewhat of an exaggeration, as it embraces the tentative offer of P. A. B. Widener for a museum, rating this at $10,000,000, and has lumped as $5,000,000 the Jeanes bequests, of which the value is unknown. Notwithstanding possible inaccuracies, the figures must be viewed as amazing. Not only do they indicate the existence of such fortunes as the world a short time ago had not known, but they indicate a spirit of liberality for which no precedent is to be found.

Mr. Carnegie alone has given away $170,000,000. Probably he has more now than when he began his futile essay to die poor. As to the wisdom of his methods that result in piling up such vast hoards that the inroads, made by liberal hand, cannot outrun accretion, question has often been raised. The particular channels into which Mr. Carnegie has elected to pour golden floods may not always make appeal to the judgment of his contemporaries. His library scheme has excited opposition —even derision. On the other hand, the Rockefeller benefactions have been, to the common taste, far more in accord with human needs, and lend themselves more directly to the promotion of human knowledge and the uplift of intelligence. It is a pleasure to observe that the Sage Millions are being loosed, and to note that Mrs. Sage in apportioning them has displayed a fine discretion. What is known as the Sage foundation, equipped with an initial $10,000,000, may do as much for advancement along scholastic lines as any similar sum ever dedicated to the work.

These generous donors demonstrate the resources of the country where conditions make possible largess on a scale of magnificence. They show, moreover, that even the people who have the faculty for "making money" have in view some higher purpose than to experience the emotion of possessing more than their neighbors. These people evince a willingness to share, and that this does not mean equal division with the profligate and incompetent is a circumstance that presents no basis for adverse criticism.—*Philadelphia Ledger.*

HISTORY AND GEOGRAPHY.

IT is a problem how to interest a beginning class in geography. Talk about the school ground, township, and the localities that you can see. Have a lesson on rock and one on coal; but when you have exhausted these subjects the problem of keeping up the interest will confront you.

This plan will prove very successful. First, all children must close their eyes and "go to sleep." Then read or tell them of the river, mountains, country, or whatever you want them to know about. They are dreaming, of course, and the next day some pupil relates his dream to the class.

Each pupil who did not "peep" or "wake up" before the signal, "Open eyes," was rewarded by receiving a little ribbon badge.

When ready to teach river, lake and island, peninsula, and so forth, take the children out to a rock nearby and point these out to them. They will remember the difference between island and peninsula, isthmus and strait, much better than if they had committed the book definitions.

Molding a Continent.—There are many teachers who would like to try molding in

their schools, yet do not know how to make the trial. The directions given below will afford a good basis for a start, and from the practice gained thereby the teacher will gain sufficient experience to continue the use of molding with his classes.

Have a box five feet long and four feet wide made by taking five lengths of board one foot wide and half an inch thick. Place these side by side and fasten them to a batten placed beneath. Around the edges of the boards nail strips half an inch thick and one inch and a half wide. The strips will thus project above the bottom one inch.

The box may be placed on a table or desk, and slightly inclined. Place in it about a half bushel of moist loam—not too moist, as it would then stick to the fingers, but with moisture sufficient to render it capable of retaining any shape into which it may be molded.

Take for the first trial South America. An outline may be drawn, and the loam filled in between the lines; or, better still, let the outline be formed as the work progresses. The pupils should do the work with such assistance as is necessary from the teacher. Have a wall map in sight of the subject in hand, also the relief-maps to be found in most geographies. Let mountains and rivers, lakes and plains, be represented by the appropriate elevation, level, or depression in the loam. Kindle enthusiasm by asking one pupil to bring some saltpetre; another cayenne pepper; others coffee, berries, wool, pieces of iron, gold and silver foil, or paper, cotton, leather, tobacco-leaf, glass, to represent diamonds, spices, etc. Let the pupils place these in their proper localities upon the molded continent, and South America will become real to them.

Geography Games.—1. Let two children come before the class and cross-question each other until one fails. Then let another take his place. This makes the pupils think quickly.

2. Let the pupils choose sides, as in a spelling match. Question rapidly from side to side, and let pupils pass to seats when they fail.

3. Let them choose sides as before. If one fails, the one who answers has the privilege of choosing one from the other side. If two fail, the one who answers may choose two, etc. If the queston comes back to the side with which it began, nothing is gained by either. This is better than No. 1, in that it keeps all on the floor; but both are good for Friday reviews.

4. Hang up a map of Europe, Asia, or of any grand division or country the class has been studying, and let some member of the class stand before the map with a pointer, ready to find any city, river, lake, mountain, sea, strait, etc., that the pupils may ask him to find. Failure to locate any city, sea, etc., on the part of the pupil at the map forfeits his place to the one who asked the question. The one securing the place at the map should, of course, on taking his place, point out the answer to his question.

5. Put an outline on the blackboard, and let the recitation be made from that. Assign one topic to each pupil at the beginning of the recitation, or number of topics or pass numbered slips, letting them draw. Example: Illinois, boundary; Indiana, capital, etc.

A Trip to Eskimo Land.—Little folks in the first class may have a very enjoyable time in Eskimo land. Take an imaginary trip to the cold country of the north, go into their "igloos," dine and spend the night with them, so as to know how they sleep, then watch the building of one of their houses.

For seat work the children may cut out little "Agoonack," her dogs, a seal, a white bear and the little Eskimo houses previously sketched; then with these as copies, draw the objects themselves and cut them out.

Have a "cozy corner" in your room. Tack cotton batting to the sides of the wall and put it over the shelf, then make mountains of it. Out of paper cut little houses and mark them to resemble bricks of ice. From stiff pasteboard cut Eskimo children and a papa Eskimo with a spear; also an Eskimo in a sled taking a ride.

The children will enjoy this corner very much, and never tire of standing there and telling each other the story of little "Agoonack," taking imaginary trips to visit her.

To Find the North.—Get the number of hours from midnight, divide by 2 and point the hour at the sun, so that the shadow of a match or lead pencil fall directly across the center of the watch. Thus 12 o'clock will be north, 6 south, 9 west, and 3 east. Suppose it is 9 a. m. The number of hours from midnight is 9; one-half is 4½; point 4.30 at the sun, so that the shadow of a match or lead pencil falls across the center of the watch, and 12 is north, 6 south, 3 east, and 9 west. Suppose it is 6 p. m. The number of hours from midnight is 18; one-half 9; point 9 at the sun and 12 is north, 6 south, 3 east, and 9 west.

When the sun is hidden on a cloudy day, take a lead pencil or stick that is well sharpened and place it on the thumb nail. By looking closely you will see a faint

shadow, which will give you a very good idea of the direction of the sun, and may be useful to one lost on a cloudy day.

A Geography Contest.—At the beginning of the study period for geography announce to the children that they will "geography down" in class. The contest is conducted in the same manner as a spelling match, questions taking the place of words.

Vary the method, sometimes, by asking the children to think of the questions. This contest will never fail to arouse the pupils to greater effort, and even the least ambitious pupils show great interest in trying to prepare the lesson well, and so gain a victory for their side.

Two Enjoyable Games.—Here are two good geography games for Friday afternoons: Two leaders are chosen, who each select in turn until all the players are taken, and are formed in lines facing each other. The leader on the other side immediately names a sea, beginning with the chosen letter, and each member of his side gives one in rapid succession. If there be a pause, the leader of side No. 1 counts ten rapidly, and if the answer is not forthcoming by the time he finishes, the one who has missed takes his seat. Next the leader of side No. 2 calls out some piece of land, as mountain, State, county, etc., and a letter; those on the opposite side answer in the same way as before. That side wins which has the largest number of members left standing. This is a short game, and can be played several times in half an hour.

Another game is played by each pupil's taking pencil and paper, and in a given time, say, five minutes, writing as many geographical names beginning with a certain letter as he can remember. When the time is up, each player reads his list, and any name that he has and the others have not, counts as many for him as there are players besides himself. When all have read, the one who scores the greatest number wins the game. If, during the reading, any name is challenged, and the writer is unable to describe it, if it be a river, sea, bay, etc., or locate it, if it be a city, town, or cape, every other player counts one.

Geographical Game.—Have the pupils choose sides. One of the leaders gives a geographical name, and the teacher counts ten very moderately. The leader on the second side must, by the time "ten" is called, give a geographical name beginning with the last letter of the one just given. Then one from the first side must do the same, alternating sides as in a spelling match. For example: Leader No. 1 gives Turkey, the next gives Yukon, the next Naples, the next Scituate, and so on. Failure to give a word correctly entitles the leader on the opposite side to choose one pupil from the side making the failure.

Talks in History.—Write a story outline of the lesson on the board, leaving blanks to be filled by the pupils. Have each child copy this and hand it in as a written lesson. Then to vary the exercise, call on the pupils to fill in the blanks.

Your class will take great interest in this mode of hearing the lesson, and you will get better results from it than by asking the questions from the book. It is best never to ask questions laid down in the book until after the teacher and pupils have talked about the subject in a free and easy manner.

Animal Zone Chart.—While studying zones, your third class will enjoy making a zone chart of animals. Cut a large circle of white cardboard about two feet in diameter, and draw the necessary lines to show the boundaries of the different zones. Request the children to bring all the pictures of animals they can find. They cut these out neatly, and the next morning you will have polar bears, wolves, tigers, monkeys, and, in fact, animals enough to supply every zone. Paste them in the zone to which they belong, and the children will spend every spare moment at noon and recess in looking at the chart and naming the animals that inhabit each zone. In this way they learn the names of the animals and the zone to which each belongs.

Flag Exercises.—Provide pupils with packages of small flags of all nations. These may be purchased in large sheets for a small sum. Let the children cut them out and paste them to sticks. Speak of flags in general; the meaning of flags of plain colors and the signs for which they are used, the white flag as a token of peace; red for war or danger; yellow for sickness, etc. Give the history of our flag. Show the significance of the flags of different countries; how they should be treated; when they are raised; when at half-mast; why used on vessels. Take the countries the children know most about, or are likely to be most interested in, and speak of the people, the climate, productions, etc., holding up the flag of a country at the time it is talked about. Give a country to let them choose one, to look up facts about for a succeeding lesson. In review, ask for a certain flag and have all hold it up, one pointing out the country it represents on the map, and each pupil telling some fact concerning it. The children may pretend they are on board ship

under a certain flag; describe of what their cargo consists, where they are going, what will be their return cargo, etc. The teacher may give the peculiarities and the children guess the country and raise its flag, or a story may be told of an imaginary trip around the world, and as each country is mentioned its flag may be displayed.—*Canadian Teacher.*

LIFE'S INVESTMENT.

BUSINESS, capital, investments. Those are the three commanding words of our day and place. If they are not written in letters of gold in every man's counting room they are stamped in letters of iron in every man's and woman's workshop. They are words that cannot be dismissed or ignored. So to-day let us accept them and interpret if possible, in terms not only of the life that now is, but of the life eternal.

The world is a great market place into which every one of us is carried by the chariot of birth, with more or less capital to invest. This investment is subjected to the same irrevocable laws of exchange as govern all other investments, among which we find as fundamental these four: 1. There is no credit at this market. The universe does a cash business with all her patrons. 2. The universe deals honestly with her patrons. Here we get just what we bargain for—nothing more, nothing less. 3. Here as elsewhere capital well invested grows. 4. Uninvested capital depreciates and sooner or later slips through the fingers of the holder.

Upon adequate appreciation and obedience to these four laws depend our moral and religious prosperity, just as much as does our industrial or commercial prosperity.

The fourth law is an alarming one: "Uninvested capital depreciates and sooner or later slips through the fingers." Oh, my friends, this would be awful were it not so sublime! It is sad to see a limb paralyzed by disuse or misuse. Alas could we see the shriveled sinews of the brain, the atrophied organs of the heart, the withered faculties of the soul! Could we know the lives once sensitive to generous things that have become ossified for want of exercise, the minds that are now capped in dark casements that once occupied apartments full of windows opening to the sky, we would stand appalled at the awful evidences that this righteous law of God is being unflinchingly executed all around us. He will not allow his subjects to retain unused talents.—*Canadian Teacher.*

GOOD REFERENCE.

JOHN was fifteen, and very anxious to get a desirable place in the office of a well-known lawyer who had advertised for a boy, but doubted his success, because, being a stranger in the city, he had no reference to present.

"I'm afraid I'll stand a poor chance," he thought, despondently; "however, I'll try to appear as well as I can, for that may help me a little."

So he was careful to have his dress and person neat, and when he took his turn to be interviewed, went in with his hat in his hand and a smile on his face.

The keen-eyed lawyer glanced him over from head to foot.

"Good face," he thought, "and pleasant ways."

Then he noted the neat suit—but other boys had appeared in new clothes—saw the well-brushed hair and clean-looking skin. Very well, but there had been others there quite as cleanly; another glance, however, showed the finger-nails free from soil.

"Ah! that looks like thoroughness," thought the lawyer.

Then he asked a few direct, rapid questions, which John answered as directly.

"Prompt," was his mental comment; "can speak up when necessary. Let's see your writing," he added aloud.

John took a pen and wrote his name.

"Very well, easy to read, and no flourishes. Now *what references have you?*"

The dreaded question, at last!

John's face fell. He had begun to feel some hope of success, but this dashed it again.

"I haven't any," he said, slowly; "I'm almost a stranger in the city."

"*Can't take a boy without references,*" was the brusque rejoinder, and as he spoke a sudden thought sent a flush to John's cheek.

"I haven't any references," he said, with hesitation, "but here's a letter from mother I just received. I wish you would read it."

The lawyer took it. It was a short letter:

My Dear John—I want to remind you that wherever you find work you must consider that work your own. Don't go into it, as some boys do, with the feeling that you will do as little as you can, and get something better soon, but make up your mind you will do as much as possible, and make yourself so necessary to your employer that he will never let you go.

You have been a good son to me, and I can truly say I have never known you to

shirk. Be as good in business, and I am sure God will bless your efforts.

"H'm!" said the lawyer, reading it over the second time. "That's pretty good advice, John—excellent advice. I rather think I'll try you, even without the references."

John has been with him six years, and last spring was admitted to the bar.

"Do you intend taking that young man into partnership?" asked a friend lately.

"Yes, I do. I couldn't get along without John; he is my right-hand man!" exclaimed the employer heartily.

And John always says the best reference he ever had was *a mother's good advice and honest praise.—Sacred Heart Review.*

SOME WONDERFUL TWO-LETTER WORDS.

Do! Go! Be! No!

Only four, and such wee words that they are apt to be entirely overlooked or swallowed up by the larger ones. Yet these four tiny words may mean everything in life and character to him who lives them.

Do! What a call to service the little word is. How insistingly it rings out its message, how imperious are its demands!

Do! Do what? God tells us, "I will teach you what ye shall do." Then let us listen to the great Teacher:

"Ye shall do My judgments, and keep Mine ordinances." We are to keep the commandments—what for? To do them. David prayed a wise prayer: "Teach me to do Thy will." "Whosoever shall do the will of My Father which is in heaven," said the Christ, would be as near Him spiritually, or as dear to Him affectionately as a brother, sister or mother.

He described one class of people as those who hear the word of God—and do it. "If ye know these things, happy are ye if ye do them." To do is to be. Doing is living; doing is—doing. Is "Do" in your dictionary?

Go! What a fine marching word "Go" is. The racers are ready, with muscles tense and nerves strained, when "Go!" shouts the starter and they're off!

God intended us to have this little word in our list and in our life, and He gave directions to His disciples: "Go ye into all the world, and preach the gospel," and the marching order of the Son of God has never been countermanded.

Be! This is yet another humble little two-lettered word, but it asks for a hearing. Be a man! Be what you should be—truthful, upright, clean, honest, loving, helpful.

To be or not to be sums up life. "Let this mind be in you, which was also in Christ," and the mind of Christ will solve the meaning of life.

There is, however, a negative side to the word. There are just as many things we are not to be: "Be not wise in your own conceits," for your wisdom of that kind will only make you the laughing stock of your fellows. "Be ye not mockers." There is no sign of cleverness in that. And once again, if we fulfill the conditions God has laid down for us, His promises include the same mighty word: for, "I will be with thee and will bless thee." "I will be a Father unto you. I will be your God."

No! Last of all comes modest little "No." Many a boy has laid the foundations of his manhood by the grit to say his first No! and to say it that it weighed as much as a six-syllabled word; when to say it at the right moment meant the standing to his colors, meant the refusal to do wrong, meant the key-note of his after-life.

It may be one of the hardest words in the English language to learn to use, but it may have vastly much to do with success in life. A no-less man may be a weak man, a "No" man may be the very personification of strength and influence.

Four tiny but mighty words: Let us repeat them: Do! Go! Be! No! Let us spell them: D-o! G-o! B-e! N-o!—*East and West.*

RUBBER.

BY R. W. WALLACE.

IF Charles Goodyear—the father of the rubber industry in America—could visit one of the great rubber factories of the country to-day, he would be as astounded at the phenomenal development of the industry as would Robert Fulton were he to see the Lusitania coming up the North river to her dock.

To so many uses is rubber put to-day that the standing problem in the business world on both sides of the Atlantic is how to get enough of the raw material to meet the ever-enlarging demand for rubber goods. These are indispensable to modern life in a thousand ways, contributing to its protection and comfort in more forms than one could easily catalogue. And this marvelous expansion has come in just two-score years. It was in 1862 that the imports of rubber became important enough to have a separate column given them in govern-

ment statistics. And then they were only a paltry two million pounds. In 1902 the imports of crude rubber had risen to more than fifty million pounds, at a cost of $30,000,000, or sixty cents a pound. The bicycle had been responsible for a large part of this increased importation. And then came the automobile with a vastly increased demand, which it was almost impossible to meet, and which carried the price of Para rubber up to $1.40 a pound.

Were it not for the invention of a process for reclaiming old rubber, the industry would be stranded, or its products would necessarily be so costly as to be prohibitive to the great mass of purchasers. To-day we are ransacking all lands for cast-off rubber manufactures, and in 1903 we imported twenty-five million pounds of this valuable rubbish to be reclaimed first, and then used over again with the addition of some new material. Only in this way has the rubber factory been able to meet the enormous demand.

Crude rubber is an elastic substance produced from the milky juices of a dozen or more tropical plants and trees. In Brazil these juices are from a rubber tree, as also in Guatemala and Mexico. The rubber of the East Indies is from a species of fig tree. On the African mainland, chiefly in the Congo and on the islands of Madagascar and Mozambique, the rubber is from shrubs and vines. More than half the world's supply of crude rubber comes from the valley of the Amazon. And the Para rubber of the region is the best in quality, commanding the highest price in the world's markets.

The production of the crude rubber is thus described by Redway: "The rubber-gatherer of the Amazon, who is practically a slave, wades into the swamp, makes several incisions in the bark of the tree, fashions a rude trough of clay under it, and waits till the sap fills the clay vessel. When the sap has been gathered, he makes a fire of palm nuts, and places an inverted funnel over it to concentrate the smoke. He first dips the end of a wooden spindle into the juice, which is of the consistency of cream, and then holds it in the smoke until the juice coagulates; this process is repeated until there has formed a ball of rubber weighing from five to ten pounds The smoke of the palm nuts is a chemical agent that converts the juice into the crude rubber of commerce."

In other countries the cream-like sap is coagulated by letting it dry on the tree, or by boiling it, or by treating it with alcohol or acids. There is no hard-and-fast way of treating it. As it reaches the manufacturer the crude rubber is full of bits of sticks, fragments of bark, and frequently of gravel. So the first process is to soften it by heating it, and then grinding and washing it till all impurities are removed. But in its pure state it is too soft to be used alone, so it must be mixed with other materials. A small per cent. of sulphur is mingled with it; it is then heated, and so becomes vulcanized. It is now more elastic, and will stand all extremes of temperature without becoming brittle, as it would not do if pure. Hard rubber is made by increasing the mixture of sulphur to 25 per cent. or even 50 per cent. Its color after this process would be gray, but by adding antimony it becomes red, or black by adding lamp-black.

The elastic properties of the rubber sap were certainly known to the early Spanish explorers and conquerors of South America. The Indians called it "caoutchouc," a name which is retained in scientific circles to this day. Samples of rubber found their way to Europe in 1736, but for nearly a century afterwards no commercial uses were found for it except to make erasers of lead-pencil marks. It was Charles Goodyear who invented and perfected the process of vulcanizing rubber, and this opened up the way for its larger use. A Scotchman named MacIntosh was the first to produce water-proof cloth by using rubber, and to the present what Americans call a "rain coat" is known in Britain as a "mackintosh."

The uses to which rubber are put to-day are practically innumerable. Soft rubber is made into rubber bands, machinery belting, threads for elastic cloths—as in suspenders, overshoes, and rubber boots, pneumatic tires, tubing, fire and garden hose, cushions, water bags, printing rolls, fruit-jar rings, stamps, and a thousand other things. Hard rubber is made into combs, brushes, fountain pens, electrical instruments, surgical appliances, trays, artificial gums for false teeth, etc. Over 100 million dollars' worth of manufactures from rubber are now turned out from the factories of the United States every year, and about one-half of this grand total is in the form of boots and overshoes.

The industry of "reclaiming" old rubber for re-use in manufacturing is a comparatively new one, but it is already firmly established. This renovated rubber is known in commercial parlance as "rubber shoddy." The process of making it is quite interesting. The scrap rubber is first separated by heat from the canvas and other things with which it is associated—as in overshoes, hose, etc.—and is then devulcanized, all the

sulphur that is in it being removed by its being put into a steam-heated cylinder, where it is kept for some twenty-four hours, and has become pure rubber again. Then it is dried thoroughly and ground up so that it can easily be mixed with new compounds. Usually some new, raw rubber is now added to it, and then the whole batch is vulcanized again, and it is ready to be made into the various articles desired. It in an ingenious process, and requires great care, but it pays for itself profitably, and much of the "shoddy" is quite as good as the original article, although were he to know it, the purchaser might not think so. And it helps out the manufacturer, who cannot always secure his full share of the world's supply of rubber, which at present is only about 135 million pounds in any given year. —*Journal of Education.*

FOR THE TEACHER.

BY LIVINGSTON SELTZER.

Can you give yourself "100" in answer to each of these questions?

Am I interested, alert, and enthusiastic?

Am I progressive, considerate, and sympathetic?

Do I come to school early every day?

Do I follow my program and course of study strictly?

Is my program well regulated and well balanced?

Do I make myself useful in the community outside of the schoolroom?

Is my schoolroom tastefully decorated?

Do I subscribe for school journals?

Am I prompt in paying for the subscriptions when they expire?

Do I ventilate the schoolroom by means of a thermometer?

Do I "pick" at pupils?

Do I speak too loud or too much?

Do I give unnecessary directions?

Do I give orders and immediately change them?

Do I use the voice when the eyes would be more effective?

Do I threaten or scold?

Am I noisy and demonstrative?

Am I gloomy, crusty, and cross?

Do I govern and teach with reference to the development of character, self-direction, and self-control on the part of my pupils?

Do I resort to corporal punishment?

Am I pleasant and cheerful in manner?

Am I prepared to present the lessons of the day in a clear, concise, and logical manner?

Do I insist upon absolute attention and do I gain this by proper means? Is it forced or is it spontaneous?

Do I discriminate between important and unimportant points?

Do I consider the ability of my pupils and assign lessons accordingly?—*Circular to Teachers.*

SOME THOUGHTS FOR FARMERS.

WHO is a patriot, a true lover of his country? He who leaves home and fortune to risk his life and all for his country's honor? Yes. He who, believing that a public office is a public trust, stands firmly for the honest, decent discharge of its duties? Most certainly. All who on tented field or public platform have stood four-square for the general good and the nation's welfare are true patriots and true lovers of their country. But true patriotism thrives not alone on the battle-field or in the public forum. It may spring from the humblest act of the humblest citizen. Embodied in song, wrought in bronze and carved in marble, the heroic deeds of the Boys of '76, who gave us the land of the free, and of the Boys of '61, who preserved us a nation of the free, have long served as our truest models of patriotism. But we must not forget that he who writes the song or carves the marble may be as truly patriotic as he whose deeds the song or stone commemorates. To add to the happiness and prosperity of one's country, to make it a cleaner, better place to live in is an act of genuine patriotism. To plant a tree or to dig a well, to drain a swamp or to clear a field is none the less patriotic because it lacks the sound of fife and drum and the rattle of musketry.

It's as patriotic to save the soil of one's native land from exhaustion and waste as it is to guard it against the wreck and ruin of a foreign foe. It's as patriotic to glory in growing fields and abundant crops as it is to rejoice in glittering battalions and bristling forts. Can you make a tree bring forth more fruit? Do it and the world will be the better for your having lived. Can you strike an acre of ground with the rod of science and make it give forth greater streams of human comfort and well-being? Do it and you have added to the wealth and worth of your country.

Have you done your share to make "the rocks and rills, the woods and templed hills" of your native land more lovely? Have you done your part to develop her vast resources and to safeguard her wealth of forest and stream and plain? If you

have, you are a patriot. If you have sought earnestly to learn the secrets of the soil, to understand its hidden forces and to control and direct them; if you have come to know and respect one small piece of land as a thing of worth and beauty, as a thing with rights which you are bound to respect, which demands and deserves honest and fair treatment, if you have an intelligent interest in and a real love for your farm—if you have all or any of these virtues I am sure you cannot be classed as an undesirable citizen of our country.

And, to arouse in your children an intelligent love for the farm with its quiet and peace, with its open stretch of field and sky, with its primal, elemental sights and sounds of living, growing things, with its simplicity, its genuineness, its wholesomeness; to rear your boys and girls amidst such rare opportunities for honest work and honest play, is an act of lofty patriotism.

The Farmers' Institute, through its county, and district, and State meetings, and through the untiring efforts of its most efficient superintendent is arousing a keen and an intelligent enthusiasm in country life and in the country school and is thereby rendering the State a distinct service in promoting true patriotism and good citizenship.—*State Supt. F. G. Blair, Illinois.*

CHARACTER IN THE FACE.

THE face as a map of character and disposition is the subject of an elaborate study by an Englishwoman. She holds that the reading of the features can be reduced to an exact science.

There is an elaborate classification of eyes. Among the broad deductions is the dictum that dark eyes invariably indicate a strong, passionate nature, while light blue ones show a calculating cool and resolute character. Light brown eyes are signs of intelligence, fancy, fickleness in love and a rapidly fluctuating temperament. A sure indication of oratorical gift is projecting eyes and they also betoken literary skill in the use of language. A strongly developed nose is a mark of superior endowments. The owner of a big nose has more energy than the owner of a small one. The majority of men who have become renowned as rulers and leaders, it is pointed out, had big noses—Caesar, Wellington, Napoleon and Nelson, for example. A man with modest intellect and a big nose can always be reckoned on to make more of a mark than a man with a great brain and a little nose. The nostrils also have their significance. Large nostrils indicate courage, little ones cowardice. Long, narrow ones show activity and bodily vigor.

Mouth and lips are full of suggestiveness. The man with a hanging underlip is apt to lack perseverance and concentration of purpose. The modest individual's lower lip is habitually pressed close against the upper lip at the center. The sentiment of hate causes a hard dropping of the lower lip so as to show the teeth. Persons who habitually show the teeth in this way are apt to be malevolent.

The chin and lower jawbone are important indexes of character. True love is evident in a face in which the jawbone broadens clear back to the level of the wisdom teeth. This is true, both of men and women.

RALPH'S USE OF HORSES.

THE rain which had poured steadily for three days now ceased, but it had left the streets where unpaved in a wretched condition, and deep ruts were cut in a heavy clay soil by the passage of each wagon.

It was about four o'clock in the afternoon that John Ryan drove along with a wagon heavily laden with coal, drawn by a span of large black horses. Deeper and deeper sank the wheels as they gathered to themselves the mucky, greasy clay. Slower and slower the horses moved, until in the middle of the block they could go no farther.

Now John was an Irishman with a quick, impatient nature, but he loved his animals and always tried to treat them as kindly as he knew how. He gave them a long rest, patting their necks, and easing the heavy bands of harness meantime, and speaking encouraging words which if not understood literally were sufficiently clear to their horse sense.

But it was getting late and they must move along, so drawing up the lines John chirruped for them to go ahead, and with willing obedience they sprang to the work, but not an inch did the wagon advance. Again and again he urged them on, but without avail. They were stuck fast in the mud.

What must be done now? I am glad to say that John Ryan never took delight in whipping his horses, but there was no one near to help and they must be made to draw, so the whip descended upon their sleek, black hides, and though with every cut they sprang forward, the load was unmoved. By this time a crowd of children had gathered to watch the situation, and among the num-

ber was Ralph White with his satchel of books over his shoulder. He was one of those boys who manage to see whatever is happening on the street for blocks around and who was not unwilling to lend a hand to any one in trouble. Ralph stood watching for a few minutes and then said:

"Mister, if you will uncheck your horses' bridle reins I think they will pull better."

John, who now was somewhat excited, answered sharply:

"What do you know about it?" and again the whip came heavily down, but all to no purpose.

"It will not do any harm to try," ventured Ralph, coaxingly.

John stood a moment looking at the boy and then stepped up and loosened the reins, patting their glossy necks the while; then taking the lines with a steady, firm hand he spoke to them again.

With whole bodies free from restraint they now gave a long, strong pull, a pull all together. This time the wagon started, and the horses, smoking and panting, struggled bravely on, followed by the crowd.

"Come here, lad, I want to thank you," said John, beckoning to Ralph.

"Now tell me how you knew that would help them to pull?"

"Why, I read it," said Ralph, modestly.

"Yes, my lad, that is the advantage you have in knowing how to read. Well, well, I thank you, and hope you will always be ready to use what you read to help somebody out of trouble."

"Three cheers for Ralph," shouted the children in a chorus.—*Young Reader.*

THE BLUEBELL.

There is a story I have heard—
A poet learned it of a bird,
And kept its music every word—

A story of a dim ravine,
O'er which the towering tree tops lean,
With one blue rift of sky between;

And there, two thousand years ago,
A little flower as white as snow
Swayed in the silence to and fro.

Day after day with longing eye,
The floweret watched the narrow sky,
And fleecy clouds that floated by.

And through the darkness, night by night,
One gleaming star would climb the height,
And cheer the lonely floweret's sight.

Thus, watching the blue heavens afar,
And the rising of its favorite star,
A slow change came—but not to mar;

For softly o'er its petals white
There crept a blueness, like the light
Of skies upon a summer night;

And in its chalice, I am told,
The bonny bell was formed to hold
A tiny star that gleamed like gold.

Now, little people sweet and true,
I find a lesson here for you
Writ in the floweret's bell of blue:

The patient child whose watchful eye
Strives after all things pure and high
Shall take their image by and by.

"The Bluebell" tells a truth but not a fact; for there are many great truths that are not facts. Even some fairy stories contain great truths. Get the pupils to draw a picture of the scene described, no matter how crude their drawings may be. By attempting in this way to express their impressions of the scene they will get better understanding of it. The dim ravine with towering treetops leaning over it, the streak of blue sky above with its one gleaming star of gold, and the little white flower at the bottom of the ravine constantly looking up to the sky and the star should be definitely imaged in their minds, otherwise they cannot really read the poem, no matter how glibly they may say the words. The little white flower from constantly watching the sky and the star and longing for them, by and by became the color of the sky with a tiny spot of gold in its heart like the star. This was the origin of the color of the Bluebell. There is no better established fact in nature and in life than this, that what one admires, longs for, strives for, aspires to, he comes to resemble more and more; he "takes their image by and by."

NOVEL WAY OF HELPING BOYS.

THREE years ago, as it is told, forty men, gathered in a church club in New York City, heard a graphic talk about the children's court, and how boys got into trouble and became criminals just because nobody cared enough about them to help them to become good men instead, says Priscilla Leonard in *The Youth's Companion.*

"Is there anything we can do?" one man asked, and the speaker's reply was:

"Yes. If each man here will take an interest in just one boy who has been in trouble, and at this critical time help him and be a sort of big brother, it will be a great service."

The forty men volunteered to try. Forty trips were taken by them individually to forty tenements, and forty bad boys found to their extreme astonishment, that they had "big brothers." The very first "hard case" visited was found in a tenement cellar. His older brother, of twelve, was out

of work; his mother lay ill with consumption there in the cellar. In a week the big brother, an energetic young business man, had moved the whole family to rooms where the sunlight came, and had found work for the older boy. No other charitable help was given but the big brother became the bad boy's hero. The children's court never saw that boy again. He is now his big brother's pride, and on the way to an honorable, hard-working manhood.

The forty big brothers organized a social club, and brought their youngsters together every other week, teaching them parliamentary law, and getting entrance for them to a large gymnasium, where trained instructors went to work to put them into good physical condition.

But except for this club, the brotherhood was an individual affair. Each man visited his protege in the boy's own home, took him out to a baseball game or for a ride in an automobile, or to dinner now and then, and showed a real interest in his work or his school. There was no preaching or lecturing at the little brother, but he was expected to behave well, and he usually did. No money was to be given, if it could possibly be helped, but a chance to earn extra money out of school or work hours could be often had through the big brother's aid.

One boy who had been in the reformatory, and could get no job on account of his record, was given work by his big brother, manager in a large business establishment. Within ten days one of the other employes objected to this boy's employment because of his past record. But the big brother stood by him, and now the lad is earning twelve dollars a week, and is recognized as honest and faithful. Without his big brother, he would probably have been a full-fledged criminal by this time.

The big brothers now have an executive council and a secretary because the example has been followed by twenty-one other groups of men in Greater New York, who have adopted small and erring brothers. The movement is spreading, and men in other cities are talking it over. There are now four hundred big brothers, and there is one woman who is an honorable member. So far the boys benefited have all been those whose cases have come before the children's court. But there is no particular reason why this should remain so, and if the spirit of brotherhood goes on developing, every neglected lad who needs a big brother may have a chance to get one.

EDITORIAL DEPARTMENT.

THE SCHOOL JOURNAL.

LANCASTER, SEPTEMBER, 1908.

N. C. SCHAEFFER. - - - - J. P. McCASKEY.

THERE was a celebration at the Boys' Central High School, September 9, when Prof. Zephaniah Hopper reached his eighty-fourth birthday and entered upon his fifty-third year as a teacher of mathematics in that institution. Mr. Hopper is still hale and hearty, and is teaching with earnestness and enthusiasm boys whose fathers he taught many years ago. In the last twenty years Mr. Hopper has not lost one day from his work on account of illness. His class this year will add to the 17,000 and more boys whom he has taught, and all of whom love and respect him. He is not addicted wholly to algebra, trigonometry and the higher mathematics, but has found his recreation in music and in botany, where he has a special interest. He says, "I am just as young as I ever was, and shall continue to walk to and from the school at Broad and Green streets just as I always have done. In fact, I attribute my continued good health to the fact that I walk a great deal, especially through the country looking for botanical subjects. Sometimes, in recent years, I have tramped as much as five miles after school hours. I have always been devoted to music. I heard the first production of grand opera here in the American Academy of Music, and I hope to hear the first production in the new Philadelphia Opera House." He graduated from the Central High School in 1844 and began teaching there in 1854.

IT was thought best by the Executive Committee of the State Educational Association to issue no pamphlet report of proceedings this year, as, without this item, the expenses are greater than the receipts. All the matter that would have appeared in such pamphlet has already been published in *The School Journal.*

DR. W. H. ELSON, president of the department of Superintendence of the N. E. A., announces that the next meeting of that department will be held in Chicago Febru-

ary 23–25, 1909, with headquarters at the Auditorium Hotel. The place of meeting originally decided upon, at Washington, by the department was Oklahoma City. The leading hotel at Oklahoma having been recently destroyed by fire, that city does not now have suitable accommodations for the members of the department, hence this change, it being known to the officers that Chicago was next in favor after Oklahoma, at the meeting in Washington.

DR. D. J. WALLER, Principal of the Bloomsburg State Normal School, formerly State Superintendent of Public Instruction, was recently operated on at Inverness, Scotland, for a serious illness. Relatives at Indiana have received word that he is doing well, with good hopes of his recovery. He has the sympathy and best wishes of hosts of friends in Pennsylvania.

THE Superintendent of one of the leading divisions of the Rock Island Railroad has issued a peremptory bulletin notifying all employees that cigarette smoking will not be tolerated, and that those who continue the habit will be promptly discharged.

HON. JAMES T. MCCLEARY is pushing a measure that should commend itself to Congress, namely, a broad and splendid highway, the best in the world, from the grounds of the White House to the battlefield of Gettysburg, to be called "The Lincoln Road" or "The Lincoln Way." No more appropriate memorial could be constructed to show our respect and affection for Abraham Lincoln. He journeyed from the White House to Gettysburg to deliver a speech which will be recited by school boys a thousand years from now, and which will stand as a classic as long as the English language is spoken. Too much cannot be done to perpetuate the memory of this noble martyr to the cause of Freedom, the best beloved of all our Presidents. It is proposed that the grand avenue shall be 150 feet wide, each side to be a 50-foot roadway, with a 50-foot plot for grass, shrubbery and flowers in the center. On one side of the boulevard will be a 20-foot trolley roadway. It will be an ideal highway for automobiles. President Roosevelt is so much pleased with the project that he is expected to recommend it to Congress in his annual message.

TEACHERS' CERTIFICATES.

AT the joint meeting of the State Commissions of Pennsylvania, Illinois, Iowa, Kansas and Washington, for the purpose of codifying and revising the school laws of their States, which was held on July 2d, 1908, at Cleveland, Ohio, in connection with the National Educational Association, the following principles were unanimously adopted as a part of the proceedings of the meeting:

On motion of State Superintendent Blair, of Illinois, on the certification of teachers, as follows:

1. Any plan for the certification of teachers shall recognize and place a premium upon academic and professional preparation for teaching with a view of encouraging such preparation.

2. After admission into the teaching profession, the continuation or renewal of a teaching certificate shall depend upon successful experience and professional growth rather than upon recurrent examinations.

3. Certificates of higher grade shall be issued in recognition of continued professional growth and successful experience.

4. There should be interstate recognition of State certificates and diplomas of recognized normal schools, colleges and universities.

On motion of Prof. Frederick E. Bolton, of Iowa City, Ia., on the promotion of higher standards of efficiency in public schools, as follows:

We believe that the State should encourage high standards of efficiency in all grades of public schools by granting special State aid to all rural, graded and high schools which reach certain standards in equipment and teaching force.

Concerning the State appropriations for the support of public schools, on motion of State Superintendent Blair, of Illinois, as follows:

Moved that it be the sense of the members of these State Commissions that not less than one-fourth of the cost of maintaining the schools of a State should come from the State treasury, and that, when the major corporations of a State cannot be taxed by the school districts, but pay State taxes only, not less than half of the expense of maintaining the schools of the State should come from the State treasury, or the State school funds.

The secretaries of the State Commissions represented were as follows: L. A. Lowther, Emporia, Kansas; Arthur Springer, Wapello, Iowa; Woods Howerth, Springfield, Illinois; Henry B. Dewey, Olympia, Washington; and G. M. Philips, West Chester, Pennsylvania.

DECLARATION OF PRINCIPLES.

THE National Education Association, at the recent meeting in Cleveland, Ohio, on July 1st, 1908, made formal declaration of principles and aims. It was adopted by unanimous vote, as reported by the special committee on resolutions, of which Dr. George M. Philips, of West Chester, was a member, and is as follows:

The National Education Association, now holding its Forty-sixth Annual Convention in Cleveland, and representing teachers and friends of education in every State in this Union, makes the following declaration of principles and aims:

1. Fully realizing that trained and skilled labor is a primary essential to the industrial and commercial welfare of the country, we cordially indorse the establishment by municipal boards of education of trade schools, industrial schools, and evening continuation schools; and further recommend that the instruction in these schools be practical and efficient, and have the advice and the approval of the trade interested, to the end that graduates of these schools may at once become advanced apprentices or journeymen.

2. We recommend the subordination of highly diversified and overburdened courses of study in the grades to a thorough drill in essential subjects; and the sacrifice of quantity to an improvement in the quality of instruction. The complaints of business men that pupils from the schools are inaccurate in results and careless of details is a criticism that should be removed. The principles of sound and accurate training are as fixed as natural laws and should be insistently followed. Ill-considered experiments and indiscriminate methodizing should be abandoned, and attention devoted to the persevering and continuous drill necessary for accurate and efficient training; and we hold that no course of study in any public school should be so advanced or so rigid as to prevent instruction to any student, who may need it, in the essential and practical parts of the common English branches.

3. We assert that the individuality of the pupil should be carefully considered, to the end that he may be instructed in the light of his limitations and capacity; and we commend to all local authorities the necessity of greater care in the arrangement of courses of study, that they may be adapted to the pupils to be instructed, rather than that pupils should be adapted to fixed courses of study and an inflexible system of grading.

4. The public high schools should not be chiefly fitting schools for higher institutions, but should be adapted to the general needs, both intellectual and industrial, of their students and communities, and we suggest that the higher institutions may wisely adapt their courses to this condition. We also suggest to school boards and superintendents the importance of securing for their high school teachers who have not only abundant scholarship but also successful experience in teaching or efficient and practical training in pedagogy.

5. There is concededly a grave moral depression in our business and social atmosphere. The revelations of the financial and legislative world for the past two years denote a too general acquiescence in questionable practices and standards. We earnestly recommend to boards of education, principals, and teachers the continuous training of pupils in morals, and in business and professional ethics, to the end that the coming generation of men of affairs may have a well-developed abhorrence of unfair dealing and discrimination. The establishment of the honor system in schools, the ostracism of the dishonest or unfair pupil, the daily exemplification in the routine life of the school of the advantage of honest and truthful methods, are commended to the especial attention of teachers as a partial means to this end.

6. The Bureau of Education at Washington should be preserved in its integrity and the dignity of its position maintained and increased. It should receive at the hands of Congress such recognition and such appropriations as will enable it not only to employ all expert assistants necessary, but also to publish in convenient and usable form the results of investigations; thus making that department of our government such a source of information and advice as will be most helpful to the people in conducting their campaigns of education. We are of the opinion that the importance of the subject under its control, and the dignity of this country require that this Bureau be maintained as an independent department of the government.

7. The National Education Association notes with approval that the qualifications demanded of teachers in the public schools are increasing annually, and particularly that in many localities special preparation is demanded of teachers. The idea that anyone with a fair education can teach school is gradually giving way to the correct notion that teachers must make special preparation for the vocation of teaching. The higher standards demanded of teach-

ers must lead logically to higher salaries for teachers, and constant efforts should be made by all persons interested in education to secure for teachers adequate compensation for their work.

8. It is the duty of the State to provide for the education of every child within its borders, and to see that all children obtain the rudiments of an education. The constitutional provision that all tax-payers must contribute to the support of the public schools logically carries with it the implied provision that no persons should be permitted to defeat the purposes of the public school law by forcing their children, at an early age, to become bread winners. To this end the child labor and truancy laws should be so harmonized that the education of the child, not its labor, shall be made the chief concern.

9. The National Education Association indorses the increasing use of school buildings for free vacation schools and for free evening schools and lecture courses for adults, and for children who have been obliged to leave the day school prematurely. We also approve of the use of school grounds for play grounds and the use of school gymnasiums and bath rooms for the benefit of the children in the crowded districts during summer.

10. Local taxation, supplemented by State taxation, presents the best means for the support of the public schools, and for securing that deep interest in them which is necessary to their greatest efficiency. State aid should be granted only as supplementary to local taxation, and not as a substitute for it.

11. The National Education Association observes with great satisfaction the tendency of cities and towns to replace large school committees or boards which have exercised executive functions through subcommittees, by small boards which determine general policies, but intrust all executive functions to salaried experts.

12. We cannot too often repeat that close, intelligent, judicious supervision is necessary for all grades of schools.

13. The rapid establishment of rural high schools and the consolidation of rural district schools are most gratifying evidences of the progress of education. We believe that this movement should be encouraged until the children of rural communities enjoy the benefits of public education to an extent approximating as nearly as practicable the education furnished in urban communities.

14. The National Education Association wishes to record its approval of the increasing appreciation among educators of the fact that the building of character is the real aim of the schools and the ultimate reason for the expenditure of millions for their maintenance. There are in the minds of the children and youth of to-day a tendency toward a disregard for constituted authority, a lack of respect for age and superior wisdom, a weak appreciation of the demands of duty, a disposition to follow pleasure and interest rather than obligation and order. This condition demands the earliest thought and action of our leaders of opinion and places important obligations upon school boards, superintendents and teachers.

15. It is apparent that familiarity with the English Bible as a masterpiece of literature is rapidly decreasing among the pupils in our schools. This is the direct result of a conception which regards the Bible as a theological book merely, and thereby leads to its exclusion from the schools of some States as a subject of reading and study. We hope for such a change of public sentiment in this regard as will permit and encourage the reading and study of the English Bible, as a literary work of the highest and purest type, side by side with the poetry and prose which it has inspired and in large part formed.

16. The National Education Association wishes to congratulate the secondary schools and colleges of the country that are making an effort to remove the taint of professionalism, and other abuses, that have crept into students' sports. This taint can be removed only by leading students, alumni, and school faculties to recognize that interschool games should be played for sportsmanship and not merely for victory.

17. It is important that school buildings and school grounds should be planned and decorated so as to serve as effective agencies for educating, not only the children, but the people as a whole, in matters of taste. The school is becoming more and more a community center, and its larger opportunities impose new obligations. School buildings should be attractive as well as healthful, and the adjoining grounds should be laid out and planned with appropriateness and beauty.

18. The highest ethical standards of conduct and of speech should be insisted on among teachers. It is not becoming that commercialism or self-seeking should shape their actions, or that intemperance should mark their utterances. A code of professional conduct clearly understood and rigorously enforced by public opinion is being slowly developed, and must one day control all teachers worthy of the name.

19. In teaching, as in every other kind of work, the best service is secured by finding the individual best fitted to the particular

place as indicated by training, experience, and meritorious service; the National Education Association therefore heartily approves a merit system of promoting teachers and filling vacancies. We assert, furthermore, that the grounds upon which a teacher may apply for a position are preparatory training, experience, and meritorious service,—in a word, professional fitness, alone; and that the use of other personal and political arguments to secure appointment is deplorable in the teacher and a serious menace to a high professional standard.

OFFICIAL DEPARTMENT.

DEPARTMENT PUBLIC INSTRUCTION,
HARRISBURG, September, 1908.

THE following are the dates and places at which the annual session of the Teachers' Institute for the year 1908 will be held. The list is arranged in the order of dates.

Allegheny, Pittsburg, August 24.
Erie, Erie, August 31.
Mercer, Mercer, August 31.
Forest, Marienville, October 5.
Lackawanna, Scranton, October 5.
Lawrence, New Castle, October 12.
Lehigh, Allentown, October 12.
Lebanon, Lebanon, October 19.
Greene, Waynesburg, October 19.
Northampton, Easton, October 19.
Schuylkill, Mahanoy City, October 19.
Susquehanna, Montrose, October 19.
Berks, Reading, October 26.
Bucks, Doylestown, October 26.
Cameron, Emporium, October 26.
Carbon, Mauch Chunk, October 26.
Huntingdon, Huntingdon, October 26.
Luzerne, Wilkes-Barre, October 26.
McKean, Smethport, October 26.
Montgomery, Norristown, October 26.
Pike, Matamoras, October 26.
Potter, Coudersport, October 26.
Warren, Warren, October 26.
Chester, West Chester, November 2.
Delaware, Media, November 2.
Bradford, Towanda, November 9.
Dauphin, Harrisburg, November 9.
Lancaster, Lancaster, November 9.
Monroe, Stroudsburg, November 9.
Tioga, Wellsboro, November 9.
Wayne, Honesdale, November 9.
Adams, Gettysburg, November 16.
Cambria, Ebensburg, November 16.
Franklin, Chambersburg, November 16.
Juniata, Mifflintown, November 23.
Mifflin, Lewistown, November 23.
Somerset, Somerset, November 23.
York, York, November 23.
Columbia, Bloomsburg, November 30.
Cumberland, Carlisle, November 30.
Montour, Danville, November 30.
Perry, New Bloomfield, November 30.
Blair, Holidaysburg, December 7.
Fulton, McConnellsburg, December 7.
Snyder, Middleburg, December 7.
Bedford, Bedford, December 14.
Butler, Butler, December 14.
Clarion, Clarion, December 14.
Clearfield, Clearfield, December 14.
Clinton, Lock Haven, December 14.
Elk, Ridgway, December 14.
Fayette, Uniontown, December 14.
Jefferson, Brookville, December 14.
Lycoming, Muncy, December 14.
Northumberland, Sunbury, December 14.
Venango, Franklin, December 14.
Washington, Washington, December 14.
Wyoming, Tunkhannock, December 14.
Indiana, Indiana, December 21.
Westmoreland, Greensburg, December 21.
Armstrong, Kittanning, Deecmber 28.
Beaver, Beaver, December 28.
Centre, Bellefonte, December 28.
Crawford, Meadville, December 28.
Sullivan, Dushore, December 28.
Union, Lewisburg, December 28.

CITY ANNUAL INSTITUTES.

Williamsport, August 24.
Reading, August 31.
Scranton, August 31.
Wilkes-Barre, August 31.
Allentown, September 28.
McKeesport, December 21.

Each of the following will hold institutes at different dates during the term: Allegheny, Altoona, Chester, Harrisburg, Hazleton, Johnstown, Lancaster and Pittsburg.

ITEMS FROM REPORTS.

ARMSTRONG.—Supt. Patton: Ford City and Applewold will build new school-houses in the near future. Prof. Austin, a recent graduate of Grove City College, has been elected principal of Elderton Academy.

CLEARFIELD.—Supt Tobias: Thirty-one examinations were held this year. All the classes were large; 565 applicants were examined; 413 received certificates. A number of teachers who have not taught for several years, holding normal diplomas and permanent certificates, have accepted schools. This has caused a surplusage of teachers.

FAYETTE.—Supt. Lewellyn: The teachers for the coming year have all been hired and the prospects for a good year are bright. The supply of teachers was greater this year than heretofore. Several new buildings are being erected. South Brownsville has let the contract for a new fire-proof building which is to contain 14 rooms. Brownsville is also erecting a 12-room building with an auditorium to seat 500 people. Dunbar township is adding to its new high school building. Many of the teachers are taking advantage of the summer training schools.

FOREST.—Supt. Morrison: Four teachers succeeded in passing the examinations for permanent certificates. The Forest county summer school closed July 3d, with an aggregate at-

tendance of 99 students. Teachers have been elected in all the districts and there are thirty-six qualified teachers without positions—some of them with successful experience.

MERCER.—Supt. Foltz: For three years Mercer county has had some difficulty in securing teachers. This year we will probably have 75 or 80 more teachers than are required for our schools. We are sorry to say, however, that in our judgment too many young, inexperienced teachers are being hired to take the places of experienced and successful teachers. We have on file in this office a list of twenty-five experienced teachers who have failed to secure schools—some of them college and normal graduates. Our teachers' institute will be held August 31st. If the Educational Commission does not recommend a course of study for the State, we hope soon to have a suitable county course arranged by the principals in co-operation with myself.

MIFFLIN.—Supt. Wills: Mr. David A. McNabb, a veteran teacher of Mifflin county, died in Lancaster, Pa., June 28th, aged about 81 years. Mr. McNabb lived in Belleville and did most of his teaching in that vicinity. He taught fifty-one terms, beginning at the age of fourteen. Because of deafness he was obliged to give up the active work of his calling about fifteen years ago, but continued to be very much interested in the work of the schools, accompanying the County Superintendent on some of his visits almost every term.

PIKE.—Supt. Westbrook: The effect of the minimum salary act of 1907 is becoming apparent. Directors have experienced less difficulty in securing teachers this year than for a number of years past. More teachers have attended normal school during the spring term than ever before. The prospects for a successful school year are encouraging.

POTTER.—Supt. Welfling: The supply of teachers in this county far exceeds the number of schools. Several holders of normal school diplomas have not yet secured positions.

SNYDER.—Supt. Stetler: Two high schools have been established during the past month. Every school in the county has been supplied with a teacher. About twenty teachers are without positions.

SUSQUEHANNA.—Supt. Stearns: A very successful school of review was conducted at Montrose by Prof. J. S. Hosterman and Miss Clara Winans. Special interest was taken in the study of methods.

UNION.—Supt. Spigelmyer: There seems to be a tendency on the part of directors in some districts to refuse applicants for schools who hold professional certificates. Upon looking into the matter I find that the personality of the individual has more to do with the practice referred to than the holding of a professional certificate. The schools are all supplied with teachers; there are many disappointed applicants. With the increased salary the directors are using better judgment in the selection of teachers.

WAYNE.—Supt. Koehler: A special election was held in Honesdale to raise the indebtedness from $45,000 to $60,000. It was carried by a considerable majority. The money is to be used for a new high school building. The sentiment of school directors generally is for better schools; hence they are looking for better teachers. It is not easy to find well-qualified principals for the township high schools, although in every case the salaries have been raised.

WYOMING.—Supt. Jarvis: The school board of Nicholson township has consolidated the Utley, Pedrick, Arch and Bacontown schools into one which will be at Bacontown. The other four schools—the Squier, Camp, Fields Brook, and Starkville—have consolidated with the big school at Starkville. Distances from Bacontown: Utley 4 miles, Pedrick 2½ miles, Arch 1¼ miles; total number of scholars, 28. Distances from Starkville: Squier 1 mile, Camp 1½ miles, Fields Brook 2 miles; total number of scholars, 20. The board has accepted bids for carrying the scholars to each of these central schools.

MAHANOY CITY.—Supt. Ehrhart: A complete course of history has been adopted for the high school. It includes the essentials of ancient, mediæval and modern, English and American history. The course covers the four years of the high school work.

BEDFORD.—Supt. Barkman: A large new school house at Mann's Choice. Broad Top township also expects to erect new buildings this year.

BUCKS.—Supt. Hoffman: Steps have been taken toward organizing a township high school in Soleberry township and one in Buckingham township. Bridgeton township is also considering the question.

CLINTON.—Supt. McCloskey: Our county has had an unusual number of young applicants for the schools. Men of experience for the several principalships are hard to find. Several districts have advanced the salaries of principals.

SNYDER.—Supt. Stetler: I had a teachers' normal class in Middleburg, more than fifty teachers enrolled, besides twenty-five prospective teachers. I must reject many applicants for certificates, taking the ground that since the salaries have been raised the standard of proficiency should also be raised.

WARREN.—Supt. Knapp: There seems to be an over-supply of teachers in our county this year. The increase in salary has, I think, had a strong tendency to hold the old teachers to the profession and has induced many new ones to enter the field. A great many of our teachers have attended normal and summer schools this year. I am trying to impress it upon them that the best qualified will stand the best chance of getting schools in the future. Sheffield has spent about $1,500 in repairs this summer and expects to add another year to the course of study.

COAL TWP. (*Northumberland Co.*).—Supt. Yocum: Our new four-room building has been completed and neatly furnished with modern furniture. Diplomas were given to all pupils completing the grammar grade—thirty in all. Twenty-one pupils were graduated from the high school. This was the first class under the three-year course.

LOCK HAVEN.—Supt. Ling: The nine-month term is retained in spite of some opposition. All teachers were elected a month earlier than usual.

CHEIRON.—From the cave came the sounds of music, and a man's voice singing to the harp. Then the lad went in without trembling, for he too was a hero's son; but when he was within, he stopped in wonder to listen to that magic song. And there he saw the singer lying upon bear-skins and fragrant boughs: Cheiron, the ancient centaur, the wisest of all things beneath the sky. Down to the waist he was a man, but below he was a noble horse; his white hair rolled down over his broad shoulders, and his white beard over his broad brown chest; and his eyes were wise and mild, and his forehead like a mountain-wall. And in his hands he held a harp of gold, and struck it with a golden key; and as he struck, he sang till his eyes glittered, and filled all the cave with light. And he sang of the birth of Time, and of the heavens and the dancing stars, and of the ocean, and the ether, and the fire, and the shaping of the wondrous earth. And he sang of the treasures of the hills, and the hidden jewels of the mine, and the veins of fire

DO THEY MISS ME AT HOME?

S. M. GRANNIS.
Per. OLIVER DITSON & Co.

Tenderly.

mf *f* *p*

1. Do they miss me at home? do they miss me? 'Twould be an as - sur-ance most dear To
2. When twilight approach - es, the sea - son That ev - er is sa - cred to song, Does
3. Do they set me a chair near the ta - ble, When evening's home pleasures are nigh? When the
4. Do they miss me at home? do they miss me, At morn-ing, at noon, or at night? And

f

know at this mo - ment some loved one Were say - ing "I wish he were here;" To
some one re - peat my name o - ver, And sigh that I tar - ry so long? And
can - dles are lit in the par - lor, And the stars in the calm a - zure sky? And
lin - gers one gloom-y shade round them, That on - ly my pres-ence can light? Are

pp *f*

feel that the group at the fire-side Were thinking of me as I roam; Oh, yes, 'twould be joy beyond
is there a chord in the music That's missed when my voice is away, And a chord in each heart that a-
when the "good nights" are repeated, And all lay them down to their sleep, Do they think of the absent, and
joys less in - vit - ing - ly welcome, And pleasures less hale than before, Be - cause one is missed from the

p

meas-ure To know that they miss'd me at home, To know that they miss'd me at home.
wak - eth Re - gret at my wea - ri - some stay, Re - gret at my wea - ri - some stay?
waft me A whisper'd "good night" while they weep? A whisper'd "good night" while they weep?
cir - cle, Be-cause I am with them no more? Be-cause I am with them no more?

and metal, and the virtues of all healing herbs, and of the speech of birds, and of prophecy, and of hidden things to come. Then he sang of health, and strength, and manhood, and a valiant heart, and of music, and hunting, and wrestling, and all the games which heroes love; and of travel, and wars, and sieges, and a noble death in fight; and then he sang of peace and plenty, and of equal justice in the land: and as he sang the boy listened wide-eyed, and forgot his errand in the song. And at the last old Cheiron was silent, and called the lad with a soft voice. And he ran trembling to him, and would have laid his hands upon his knees; but Cheiron smiled, and drew the boy to him, and laid his hand upon his golden locks, and said, "Are you afraid of my horses' hoofs, fair boy, or will you be my pupil from this day?" "I would gladly have horses' hoofs like you," the boy replied, "if I could sing such songs as yours."